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AUGUST 2011

3rd
edition

PUBLISHED BY

myForesight™

MALAYSIAN INDUSTRY-
GOVERNMENT GROUP
FOR HIGH TECHNOLOGY

FOR INTERNAL CIRCULATION ONLY
ISSN NO: 2229-9637

myForesight™

MALAYSIA'S NATIONAL FORESIGHT MAGAZINE



FORESIGHT IN ACTION:

GREENING THE FUTURE

Malaysian Biomass
Initiatives

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Radio Frequency Identification (RFID)



**ANIMAL
TAGGING**



**LUGGAGE
HANDLING**



**PRODUCT
AUTHENTICATION**



**ASSET
MANAGEMENT**



**ITEM
LEVEL TAGGING**



A tiny chip with great potentials !

SENSTECH is paving the way for mass adoption of sensor technologies by leading the Malaysia Microchip (MM) Project, which is a government-initiated project to exploit the potential of Radio Frequency Identification technology for large scale use.

As an establishment under the Malaysian Industry-Government Group for High Technology (MIGHT), SENSTECH is primarily responsible for managing, coordinating and executing the operations of the MM Project.

Senstech also function in the business of promoting and developing the RFID Industry in addition to establish Malaysia as an RFID Industry leader. Malaysia Microchip has been developed into three variance; MM1, MM2, MM3.



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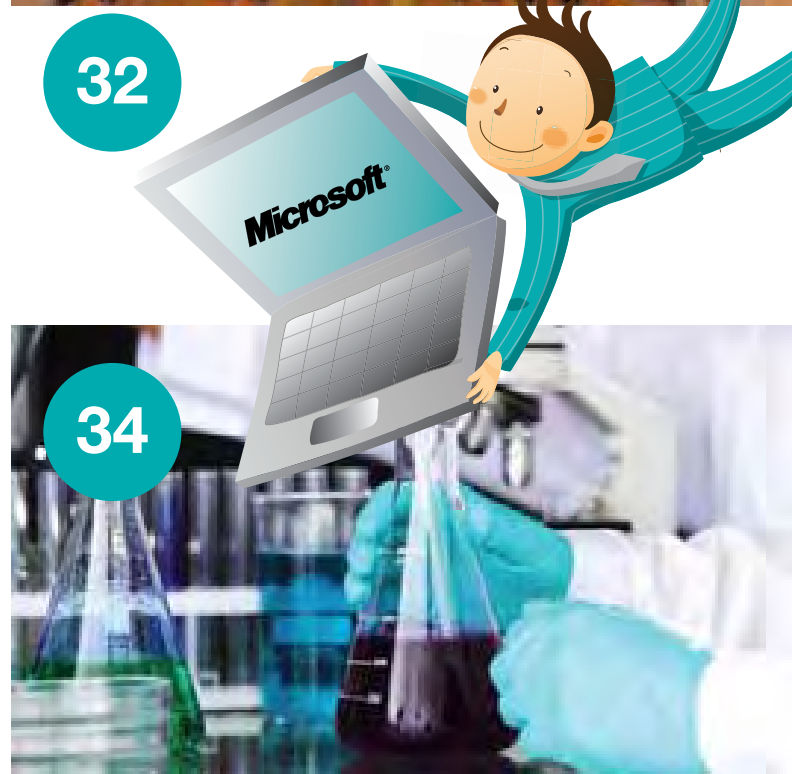
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editor's note



Initial Thoughts

BY
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Talk of the future has never failed to illicit comments from individuals with diverse and marginalizing opinions. This is especially true in the form of things we need to focus on to reach our desired future.

It has been an interesting quarter for us at myForesight. The past few months saw us presenting our body of work to the global audience during the FTA conference in Seville, Spain; experts and colleagues in Manchester Institute of Innovation Research (MioIR) as well as participants of a seminar organized by ISTIC-UNESCO. Whereas at the home front, recommendations were being considered, uptakes on the focus areas are made and to be implemented into realizable programmes.

This is particularly true in the case of conversion of palm oil into bio mass energy which is our cover story. The Malaysian Biomass initiative (MBI) is a programme under the Global Science Innovation Advisory Council (GSIAC) which was announced with much fanfare in New York by our Prime Minister on the 17th of May 2011. Leveraging on global network and expertise, GSIAC will be the platform for Malaysia to tap into the knowledge of world renowned experts in their respective field in the realm on S&T. Suffice to say that the selection of the initiative took stock of the focus areas identified by myForesight.

We have also presented findings that were made during the last National Technology Foresight to the newly formed National Science & Research Council (NSRC). One of the main tasks of the NSRC was to identify and prioritize the focus areas for Malaysia's R&D activities. Note that the council members pointed out that to prioritize the areas, it must satisfy the following:-

- ◆ Utilization of a well-known framework/model;
- ◆ The process must be transparent;
- ◆ Will be problems or issues based either realized or anticipated;
- ◆ Trans-disciplinary and diverse engagement of stakeholders;
- ◆ Considerations into long term impact and strategies;
- ◆ Considerations of resources and competencies.

Foresight anyone? Keep watching this space for more updates on this matter. You will find details on the NSRC on page 34.

Talk of the future has never failed to illicit comments from individuals with diverse and marginalizing opinions. This is especially true in the form of things we need to focus on to reach our desired future. Now, it seems that everybody is currently jumping into the PEMANDU ETP NKEA bandwagon. Unfortunately, there are widespread misconceptions that anything that is not part of the NKEA is not worth taking a look. People tend to forget the NKEA are short to medium term focus areas which is intended on trying to achieve our aspirations of being developed nation by 2020. However in envisioning the future, there are other considerations that needs to be taken into

account; social & environmental impacts, safety & security etc. It is worth to note that PEMANDU themselves acknowledges the NKEA are not intended to be definitive but serves as a starting point.

Tan Sri Dato Zulkifli's article on envisioning Asia 2060 describes on the need of taking various factors into account in developing visions of the future.

Through our participation of FTA conference in May, we have managed to widen our network, leverage on the experience of other countries that has also conducted foresight initiatives. Therefore, in this issue, we are providing the Brazilian case study of the challenges in communicating foresight results to decision makers.

For this issue, insights from the industry includes Datuk Abdul Kadir's piece on the business potential of waste water sector as well as contributions from International Natural Fibre Organization on the future of natural fibre.

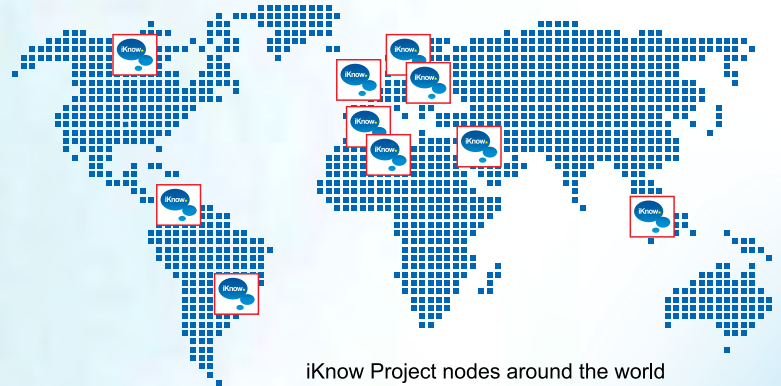
As usual, we hope you find the magazine beneficial and thought provoking.

We expect you to have your opinion on certain matters. We want to hear them. We welcome your feedback and contributions.



The iKnow Project

- The **iKnow Project** is a blue sky research and horizon scanning project launched by the European Commission. The aim of the iKnow project is to develop and pilot conceptual and methodological frameworks to identify, classify, cluster and analyse wild cards (WI) and weak signals (WE).
- **Wild Cards (WI)** are situations/events with perceived low probability of occurrence but potentially high impact if they were to occur. **Weak Signals (WE)** are unclear observables warning us about the probability of future events (including Wild Cards). Both WI-WE implore us to consider alternative interpretations of an issue's evolution to gauge its potential impact.

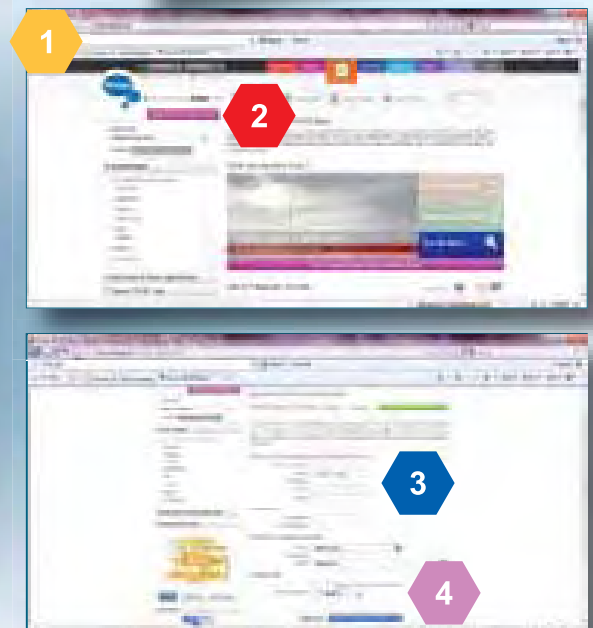


- The project is lead by the University of Manchester with the support of seven other partners :
 ① Finland Futures Research Centre (Finland), ② Z_punkt (Germany), ③ RTC North (UK), ④ Technology Centre of the Academy of Sciences (Czech Republic), ⑤ Interdisciplinary Centre for Technology Analysis & Forecasting (Israel), ⑥ Mindcom Ltd (Finland) and ⑦ CyberFox (Czech Republic).
- Consequently, myForesight™ has been nominated to be the iKnow Project Node in Malaysia. We are now officially inviting you to join and participate in the Delphi survey (<http://wiwe.iknowfutures.eu/>), to identify thematic wild cards and weak signals that relevant to our nation. Your responds and compiled feedbacks will contribute to the analysis of results against other countries and a country report.



How to register at iKnow Delphi Survey

- Step 1** Go to <http://wiwe.iknowfutures.eu/>
- Step 2** Click 'Register for DELPHI Survey'
- Step 3** Complete the form
- Step 4** Click 'Register & Participate' in Delphi Survey
- Step 5** Follow the instruction and respond the survey



leader's insights

Envisioning Asia 2060



BY
PROFESSOR TAN SRI DATO' DZULKIFLI ABD RAZAK

Vice-Chancellor
Universiti Sains Malaysia

Experience has shown that countries that grow rich are not necessarily those well-endowed with natural resources but those that invest wisely in building their human capital and allocating a reasonable percentage of their gross domestic product to research and development.



A group of experts met last week at Tamkang University Graduate Institute of Future Studies in Taipei to discuss "Global Transitions and Asia 2060". The broad focus of the meeting, co-hosted by the US-based Foundation for the Future was on three areas — climate, political economy and identity. The writer gave the keynote address.

The meeting came out with four possible scenarios for the future, ranging from a borderless Asia in a changing world to one that is fragmented over and above the current geopolitical boundaries. The possibility of some of the bigger countries splitting up into North and South, or even East and West portions was not ruled out.

Overall, perhaps the two most contentious ideas in the discussions related to the issue of the "tangibles" against the "intangibles". The former reflected the thinking of the previous century and was dominated by the existing Western-centric matrixes despite the increasingly precarious position of the so-called "Washington consensus".

The competing interests of economics and geopolitics are still measured and characterised by rules and procedures dictated by several international agencies marked by their vested, if subtle, pro-West agenda. Hence, virtually nothing new emerges based on the "tangibles". Asia is trailing very much behind, struggling with the catch-up game laid out by the West.

In contrast, the contending view based on the "intangibles" is a more challenging one, drawing from the strengths and norms that are closely associated with, if not uniquely, Asia.

The key argument is about bringing into focus the unifying elements that could make an Asian "entity" based on commonalities as a source of cohesiveness. These are by and large the enduring shared Asian values, without which it is difficult to imagine even a cluster as successful as ASEAN lasting. This is critical to realise because Asia is too diverse in terms of not only its population and geographical size, but its level of development, governance and democracy, distribution of wealth, as well as existing disparities. Thus, the European

Union may be too Eurocentric to be modelled by Asians in creating a common platform.

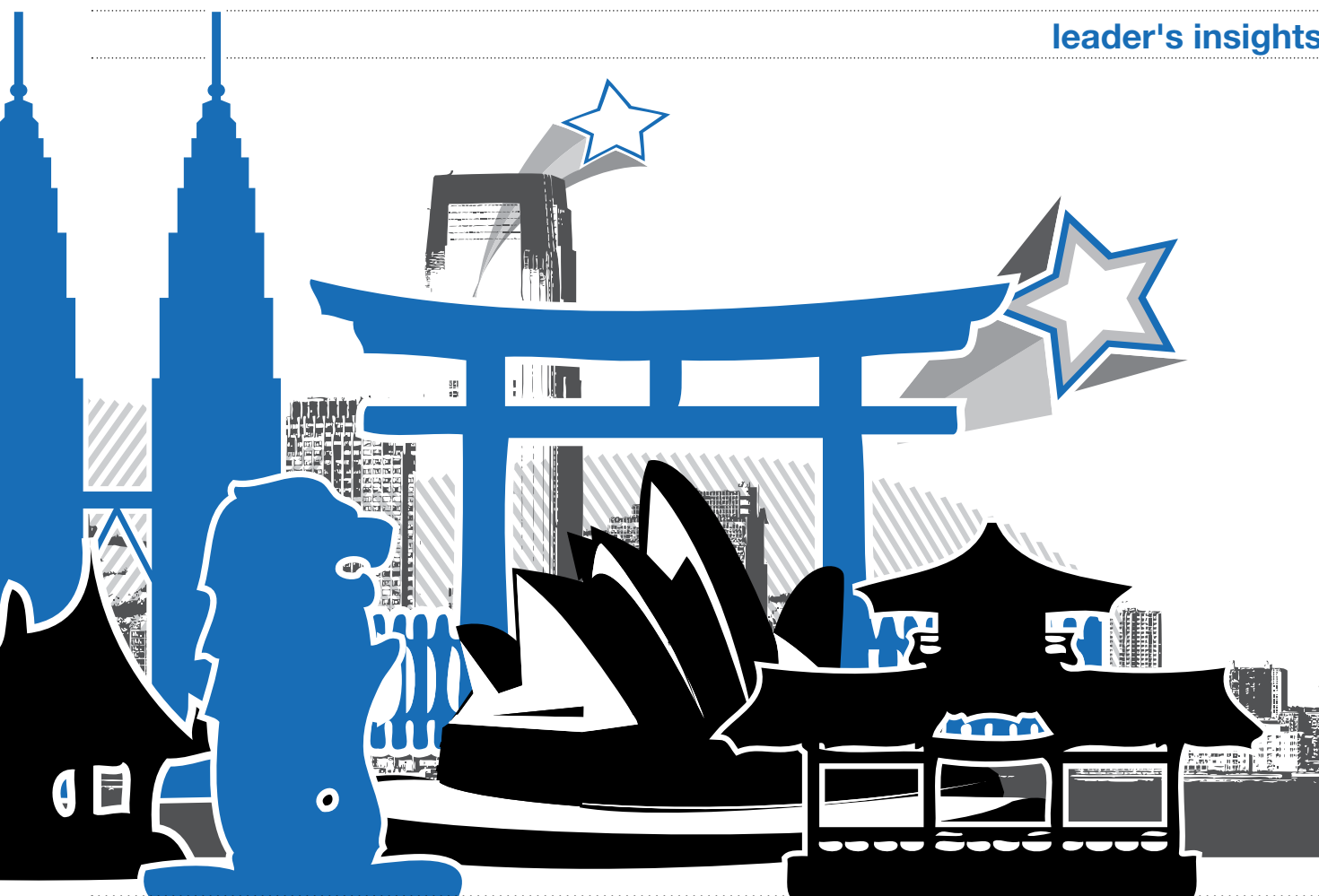
Interestingly, Jeremy Rifkin made a similar observation vis-a-vis the US when he recognised as early as 2005 that the American Dream was dying. "The American model is not working and globalisation under American stewardship has failed totally," he was quoted as saying (International Herald Tribune, March 26-27, 2005).

He envisioned an European Dream "while trying to make European policies the default for the rest of the world..."

In the same way, Asia needs to be doubly cautious about blindly emulating the existing models in the West, especially in a new millennium with its multitude of new challenges, given the perception that a shift of gravity is taking place from the West to Asia as the world's economic dynamo.

However, some are still in denial this is happening. One view expressed in the Foreign Policy

leader's insights



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magazine (July-August 2009) noted that Asia is nowhere near closing the economic and military gap with the West. It added that Asia does not seem to play an equally inspiring role as the West as a thought leader. It seems that we are back to the importance of the "intangibles" beyond the idea of nation-states and the capitalist ideology being alien to this part of the world. After all, Asian roots are more community-oriented vis-a-vis that of Americans and Europeans.

With respect to this, I posed three questions that Asia needs to seriously ponder if it is to make a difference beginning five decades from now. First, as Asia pushes forward into the future, how much of the current global construct can it reshape to make it more just and fair? In the previous centuries, many global agendas were pursued by the industrialised countries of the global north that invariably put their interests ahead of the rest, including Asia, perpetuating an uneven playing field. Can Asia provide a more equitable leadership?

Second, unlike the Western hemisphere, its Eastern counterpart has somehow been fragmented into at least "Near", "Middle" and "Far" East that ultimately make up much of Asia. To what extent can Asia iron out the apparent differences and become a truly unified global force of the future? Can Asia and its rich historical, cultural and civilisational experiences celebrate diversity as a major unifying platform towards a more globalised world?

Lastly, given that the Confucian, Vedic and Islamic ethics are generally pervasive throughout Asia, how far can they collectively redefine the current global ethics that evolved during the days of the Renaissance of Western Europe? This is taking cognizance of the fact that today's global ethics are failing, as indicated by the various global crises extending into ecology, economics and also geopolitics, which therefore need to be urgently revisited.

In essence, to what extent are the three dimensions of climate, political economy and identity factored into the Asia 2060 equation? On the issue of

climate, for example, Asia's large population base and the worsening overall pollution trends can cripple its future ambitions.

Similarly, on the political economic front, some participants were mindful of Asia's history that is littered with conflicts for power and resources, now that China and India are being dubbed the new colonisers.

Ultimately, this will have drastic ramifications for the issue of identity for Asia's existence as a unique non-Western entity and value system amidst the faltering Western Dream (not just American) that Rif in referred to.

That is not to say that Asians cannot learn from the experiences of others, since it is naive to assume that Asia has all the answers — especially in creating a more inclusive Global Dream, one that has the characteristics of an Asian Dream as well.

This article was published in The Edge Malaysia - 22th November 2010

experts' insights

Foresight and Challenges In Communicating Its Result To Decision Makers



BY
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This article is an excerpt from the original paper entitled "The Challenges of Communicating the Foresight Study Outcomes to Better Advise Decision Makers in Policy and Strategy Matters". The paper was presented during the Fourth International Seville Conference on Future-Oriented Technology Analysis (FTA) and Grand Societal Challenges in Seville, Spain on the 12-13th May 2011.

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INTRODUCTION

The Center for Strategic Studies and Management - CGEE is a non-profit Brazilian think tank, created in 2001 and qualified as a Social Organization by the Brazilian President, and supervised by Ministry of Science and Technology, in order to promote Science, Technology and Innovation (ST&I) development to advance economic growth, competitiveness and well-being in Brazil. The scope of CGEE's activities covers three integrated themes: foresight studies; strategic evaluation of large programs and projects; and information and knowledge diffusion related to the Brazilian ST&I System. CGEE is considered an interface organization in the ST&I environment. It has the responsibility of articulating Government, Private Sector, Academia, and other relevant ST&I representatives in the sense of gathering collective understanding to develop its activities. From 2001 to date, CGEE has conducted nearly 400 foresight studies and program/project evaluations, mobilizing more than 2000 experts per year coming from 300 institutions.

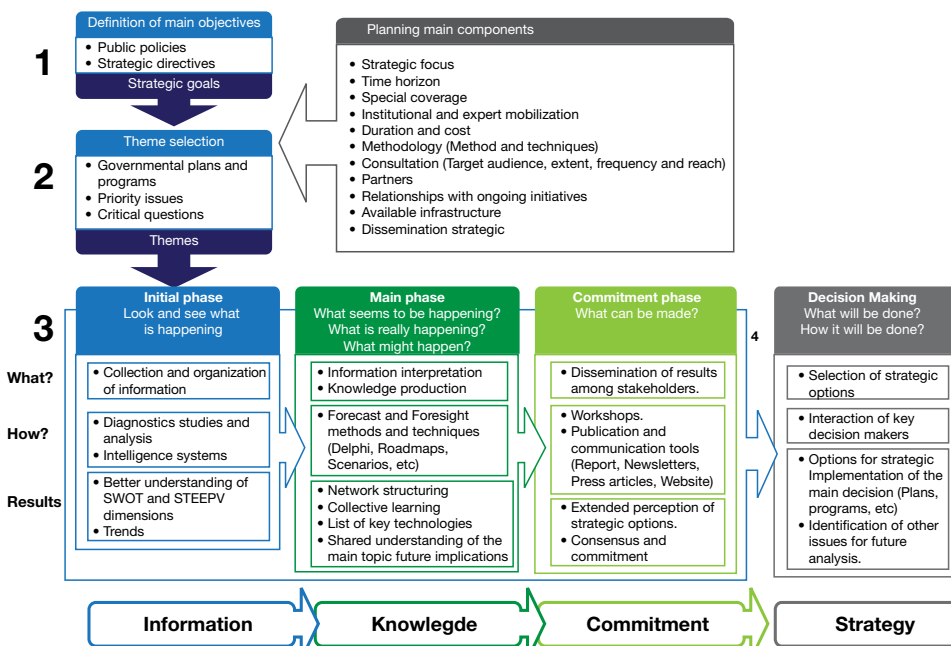
This article addresses the challenges of communicating the results of foresight processes to Brazilian decision makers in a way that truly supports their decisions. It stresses the role of intangibles as a central outcome of foresight exercises and the importance to promote out-of-the-box thinking. Lessons learned are presented as well as a case study.

OUT-OF-THE-BOX THINKING IN FORESIGHT EXERCISES

The concept of out-of-the-box thinking adopted by CGEE is related to the Learning Organization Theory (Tosey, 2005). The idea is to establish an oriented process aiming at making decisions or

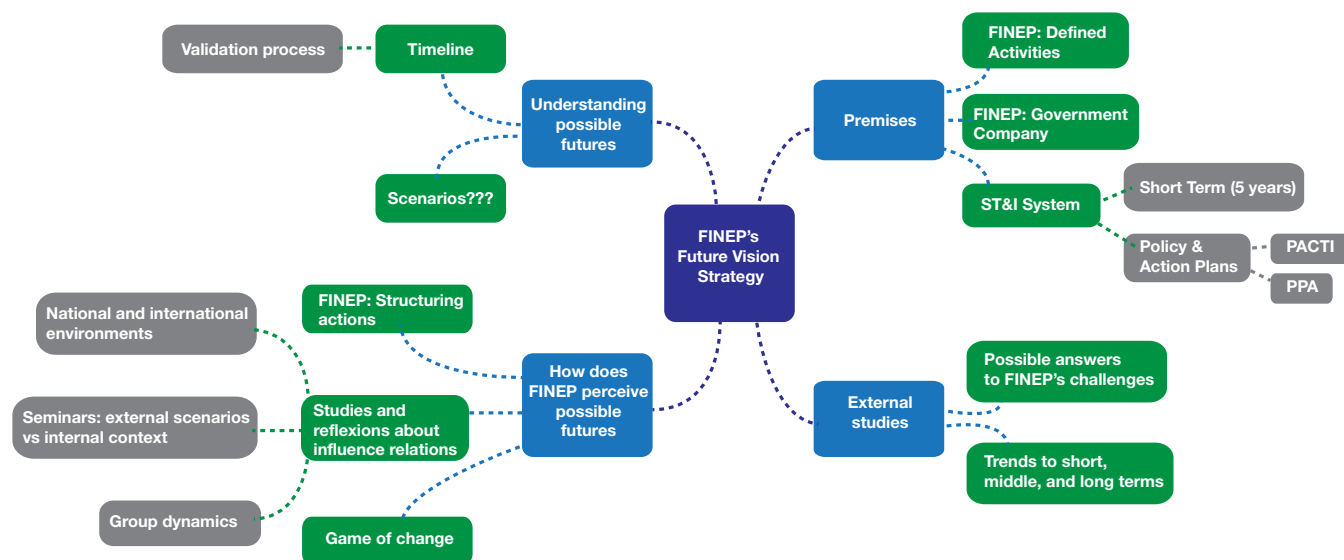
sharing perceptions, free of prejudices, cultural influences, and reasoning processes. This concept requires that experts and other stakeholders think about new possibilities and collectively foresee related approaches, imagine influences and impacts regarding a specific issue. The mindset revision with experts and stakeholders uses mainly qualitative approaches.

Figure 1 CGEE's Methodological Approach



experts' insights

Figure 2 Strategies to promote out-of-the-box thought



INTANGIBLES

High importance and attention is given to the generation of intangibles along the development of strategic foresight exercises. The process of sharing experiences, the collective learning and understanding, the creation of shared commitment on the main decisions to be taken and the shared vision on future possibilities are all intangibles to be pursued. Their value many times surpasses and complements tangible outcomes, such as reports and publications, as they are usually absorbed as knowledge by those participating.

METHODOLOGICAL APPROACH

There are some key elements embedded in CGEE's methodological approach. First and most important, stakeholders must be involved in the exercise from the very beginning. They must feel comfortable and confident to participate in all phases, irrespective to the complexities involved. To have them engaged, CGEE's team must listen, interpret and understand the client's needs, desires and preoccupations and to describe and translate - to all participants, in an understandable way - the main objectives and strategic goals taking into consideration possibilities, opportunities and different perspectives.

Second, introducing collective intelligence over all phases of the process in a systematic manner is the key for achieving success (Glenn, 2010). In other words, collaboration, interaction and communication are all important, as well as attempts to design and plan the foresight exercise with a sense of anticipation, pointing out the most difficult points and where revisions of mindsets are expected.

The foresight exercises conducted by CGEE comprise three distinct phases, as seen in **Figure 1**. The Initial Phase establishes the baseline of the exercise, usually mapping what is going on related to the main issue. The Main Phase is where most interpretation of information takes place and creativity is required at the best of the participant's capacity. Studies, scenario planning, workshops, and electronic tools are applied, among others, in order to revise and transform mindsets, understand possible futures associated to the main issues. In this phase, CGEE intends to build a good decision-making process, making it as comprehensive as possible. In the Dissemination Phase the main recommendations are fine-tuned with decision makers in all their aspects and an implementation strategy is first designed.

CASE STUDY: BRAZILIAN INNOVATION AGENCY.

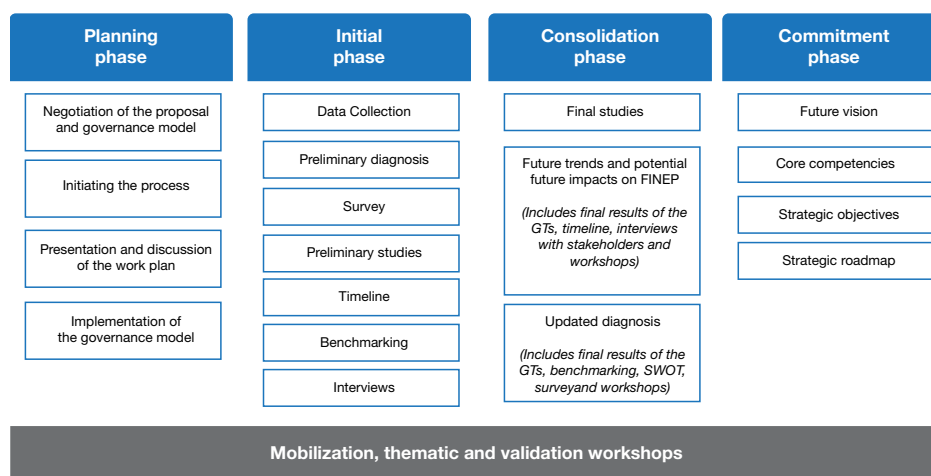
This topic describes briefly how CGEE recently conducted an organizational foresight exercise for the main federal ST&I funding agency in Brazil – FINEP, also known as the Brazilian Innovation Agency (Coelho, et al., 2011). FINEP's mission is to promote the economic and social development in Brazil through public funding of science, technology and innovation in businesses, universities, technological institutions and other public and private organizations.

The challenge of promoting out-of-the-box thinking was very complex in this case. It required a broad exercise of exploring future perspectives and a systematic process of questioning "what is going on" and "what should we do differently", with the participation of staff and a range of potential beneficiaries and stakeholders. **Figure 2** presents the main ideas and designed strategy on how out-of-the-box thinking was implemented at the agency.

The turning point to truly revise its mindset was when FINEP was prepared to visualize its challenges and a feasible strategic position for itself in the future. In other words, to define a challenging, yet successful, Future Vision required a strategy which, on one hand, should balance the knowledge related to the present and some relevant future possibilities, and on the other hand, should compare, contrast and merge the internal and external views.

experts' insights

Figure 3 Methodological process for the development of FINEP/SMP



situation emerges from the policy environment. The sense of timing is related to the sense of opportunity so as to create initiatives and projects in the course of a government mandate. The main challenge is to introduce a long-term perception and analysis to elaborate strategic foresight for the interest of the State.

Second, in the corporate sector, in general, there is doubt about the importance of long-term strategies. The sense of timing is driven by the necessity of urgent decision-making. An aptitude can be noted for a competitive intelligence approach rather than strategic foresight. But, on the other hand, when a strategic foresight starts to make sense, this kind of stakeholder usually invests in getting involved in the foresight exercise and, afterwards, becomes one of the most active decision makers and takes advantage of the foresight outcomes.

Last, the Academia circle has strong barriers in accepting strategic foresight conduction. In this case, time is not a problem; the scientific and methodological rigor is more important and it is crucial to get this kind of stakeholder involved. After this first moment, the strategic foresight exercise becomes an extremely gratifying activity.

In concluding, the Foresight exercises are usually exposed to some dangerous traps or milestones along their applications. In order to avoid these situations, it is important to note some characteristics related to each group:

- Government representatives frequently start making decisions before interpreting what was obtained in the first phase (information and data gathering), as discussed before.
- Corporate executives may have difficulties thinking beyond their business. Foresight exercises and innovation strategies are interconnected and it is important to stress the possible influence and impacts from other business segments.
- Academia often has difficulties thinking beyond disciplinary structures. Due to a long disciplinary tradition of research and learning in the academic world, when foresight exercises and innovation strategies are applied to new future possibilities in academia, huge efforts of mindset revision and transformation are needed.

The construction process, shown in **Figure 3**, was participatory and involved internal and external stakeholders in a continuous process of value addition to the information obtained in the process, always searching for consensus among the participants at the various stages of the process.

The planning phase included defining the strategic management plan methodology and governance model for managing the process, motivating and mobilizing the workforce.

Some premises oriented the proposal:

- *Participatory process* - the involvement of managers, employees, experts and stakeholders in all stages of the process.
- *Commitment* by the senior management, regarding the process, the methodology and the results obtained.
- *Strategies* focused on prospective vision and on the definition of strategic guidelines covering horizons of 5, 10 and 15 years.
- *Thinking out-of-the-box*, with the stimulus to do different things differently.
- *Governance model* built to contribute to the development of the plan, validation and application of results and with clear attribution of responsibilities between the parties.

The methodological approach assured, through the participatory process, the commitment of an expressive contingent of internal and external

stakeholders – around three thousand people-, not only with the process, but also – and mainly – with its continuity.

This represents an important intangible gain, where the process was as important as the outcomes. Strategic foresight proved to be a powerful instrument for long-term planning, counting on a diversity of methods and techniques and, above all, having flexibility and resilience in its application which enabled its adaptation to the specific needs of the study.

The principle of participation that generates commitment and the use of methods that rely simultaneously on evidence, creativity, expertise and interaction, conferred methodological robustness to the process and provided quality to the results.

LESSONS LEARNED

The case study presented, as well as others prepared by CGEE, identified three types of decision makers: government, corporate, and academia.

Their different perspectives must be taken into consideration during the development of the foresight study and when communicating its results. Preparation and delivery timing vary substantially among government, corporate and academia clients, so it is very important to be aware and respect their timing.

First, the Government sector usually desires to make decisions when some problem or urgent

New Business Potential Via Resource Recovery in the Wastewater Sector



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industry insights

INTRODUCTION

Historically, the first thought of sewage treatment dates back to the end of 18th Century when septic tanks were introduced in the West. By the nineteenth century sewage treatment methods developed rapidly to meet the needs of basic sanitation. Today, modern and sophisticated treatment technologies are continuously developed for the purpose of protection of environmental quality in a cost efficient manner. The key driver for this trend is the increasing need for a more sustainable long term solution in terms of both the economics and the environment.

In this regard, the current practice in safe disposal of end products from sewage treatment namely, the effluent and sewage sludge, will no longer be able to meet the complex environmental challenges of climate and water sensitive futures. For this, the sewage treatment industry needs to be transformed into a resource harvesting industry. This paper describes the paradigm shift from traditional basic treatment to potential new business model via resource recovery in the sewerage sector. The key idea is utilizing the 'Green Technology' and 'Zero Waste Concept' to transform the sewerage industry into a sustainable and economically attractive model.

BASIC SEWAGE TREATMENT

The typical treatment process flow for a modern mechanized activated sludge plant is depicted in **Figure 1**.

Basically it involves 2 main components namely: (i) Pre-treatment for grit and grease removal; (ii) Main treatment process units where the major organic and solids pollutants are removed via Biological process (ie. secondary treatment). The secondary treatment process involves a reactor or tank for biological breakdown of organic pollutant by native sewage microbes (i.e. MLSS). This basic secondary treatment technology produces clear effluent that can be discharged into the environment, whilst the waste sludge (WAS) is typically stabilized and dewatered into semisolid form (at 15-20% dry solid content; also known as biosolids) for disposal to landfills. If the stabilization process is involved, there is anaerobic sludge digestion and biogas is produced as well.

More recently technologies are focused on enhancing nutrient removal namely nitrogen and phosphorus as well as in reducing the operating energy requirement of systems as well as smaller

Figure 1 Typical Sewage Treatment Process - Activated Sludge System -

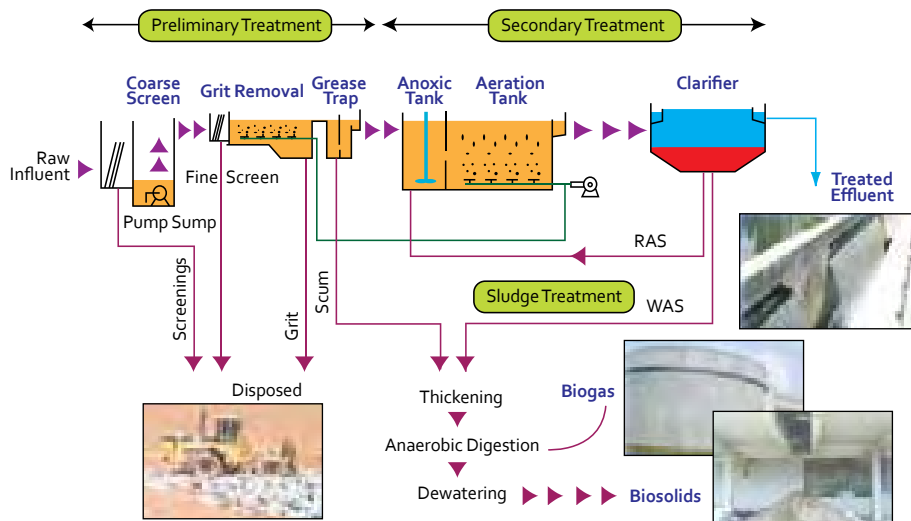
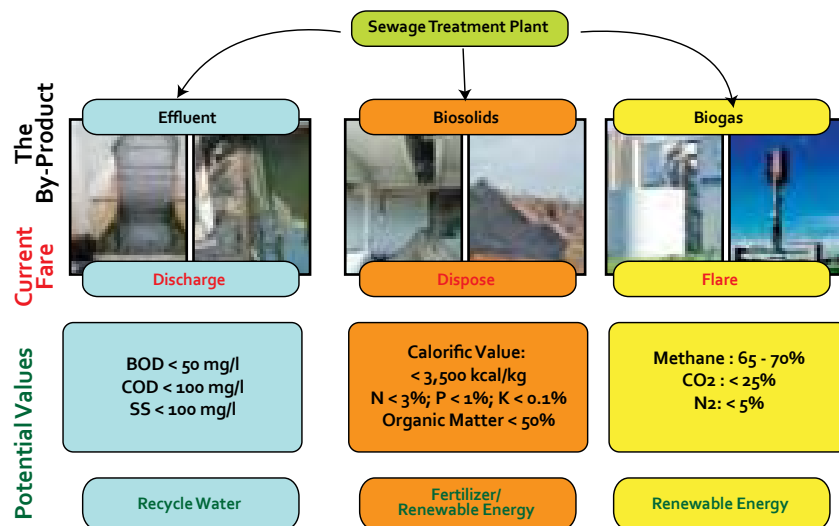


Figure 2 Resource Potential from Sewage Treatment



foot print. The latest being a variation of Sequencing Batch Reactors, Moving Bed Bioreactor, Membrane Bioreactor, Combination of Anaerobic UASB (Upflow Anaerobic Sludge Blanket) and Aerobic systems. Although these developments produces high quality treated effluent, the waste by-products remains typically disposed unto the receiving environment.

Plausible scenarios were then created to enable the identification of technology priorities that is required to support the nation's vision 2020.

industry insights

Figure 3 Bioeffluent Reuse

Parameters	Units	Average	WHO Std	MOH Std
Colour	Hazen	<5	15	15
Turbidity	NTU	<0.5	5	5
Aluminium	mg/l	<0.01	0.2	0.2
Chloride	mg/l	<1	250	250
Copper	mg/l	<0.01	2	1
H ₂ S	mg/l	<0.01	0.05	0.05
Iron	mg/l	<0.01	0.3	0.3
Manganese	mg/l	<0.01	0.5	0.1
Sodium	mg/l	5.58	200	200
Sulfate	mg/l	1.75	400	400
TDS	mg/l	12.9	1000	1000
Zinc	mg/l	0.02	3	5
Flouride	mg/l	0.07	1.5	0.9
Hardness	mg/l	<1	30*	500
Silica	mg/l	0.2	10*	10*

- IWK's Pilot Project – Effluent to Recycle Water
- The results meet the WHO and MOH standard.



Advantages of Recycled Bioeffluent System

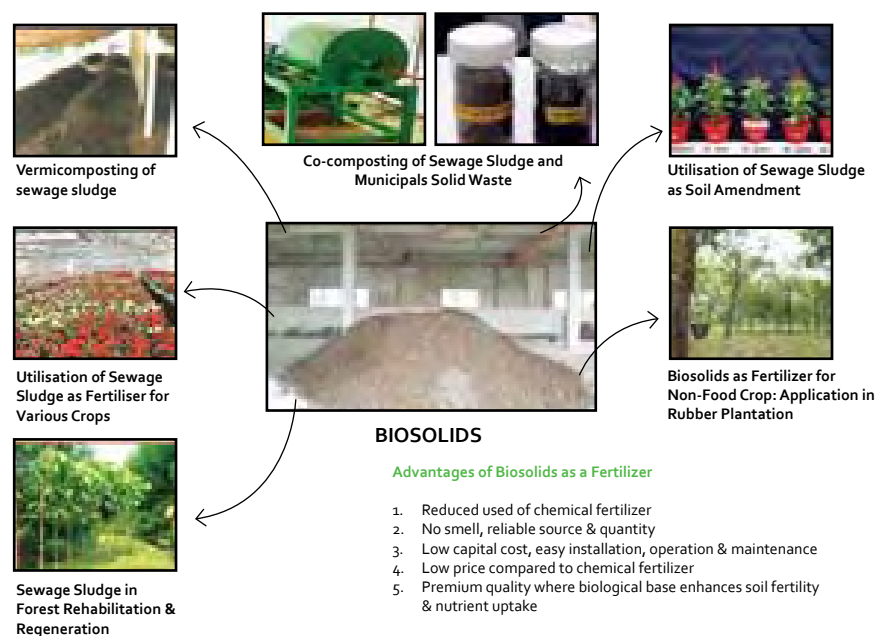
- No requirement for advance technology
- Low capital cost
- Easy installation, operation & maintenance
- Reliable source, quantity
- Low price compare to potable water

example of bio-effluent quality is shown in **Figure 3**. Treated effluent without any additional treatment was also found to be beneficial to plant growth, potentially with chlorination such application can be widely and applied. Such potential needs to be realized as it will greatly relieve water stress areas and contribute towards sustainable water resources for future.

The potential benefits of biosolids reuse is far reaching. R&D studies has shown there is sufficient nutrient content in the biosolids where the typical values of N:P:K average at 3% of the biosolids whilst its organic matter content is typically more than 50% and can contribute to improving soil conditions and nutrient uptake for plant growth (see **Figure 4**). The energy value contained in the dry solids is also a potential to be tapped via gasification process. Analysis of typical biosolids from IWK plants in Malaysia show the calorific value ranging from 2000 to 3500 kcal/kg.

Another potential is the energy available within biogas generated from anaerobic digestion, at 65% methane composition there is a minimum of 5000kcal/m³ of biogas being generated (**Figure 5**). For each of these potentials the Green Technology methods and approaches are summarized in **Table 1** and **Figure 6**. Green Technology is envisioned by Malaysia's Premier Y.A.B. Dato' Sri Mohd. Najib bin Tun Haji Abdul Razak as one of the emerging drivers of economic growth for the nation. The national Green Technology Policy was officially launched in July 2009 which defines green technology as "the development and application of products, equipment and systems used to conserve the natural environment and resources, which minimizes and reduces negative impact of human activities". Hence technology for resource recovery for water, nutrients for soil and vegetation and renewable energy is very much in line with our national aspirations for a green economy that meets the complex demand of the impending carbon neutral and sustainable future.

Figure 4 Biosolids Reuse



POTENTIAL NEW BUSINESS IN SEWAGE VIA RESOURCE RECOVERY & GREEN TECHNOLOGY APPLICATION

There are three (3) waste byproducts, treated effluent, biosolids and biogas that can be converted for beneficial reuse is as shown in **Figure 1** whilst

the potential value for reuse is summarized in **Figure 2**. Treated effluent can be reused for landscaping and industrial applications. Local research had identified this potential and shown that with additional downstream filtration units that can range from media based, to membrane and or RO types can produce bioeffluent for industrial uptake. An

The application of Green Technology to produce value and material from sewerage waste by products will have the following benefits:

- Minimize discharge of treated effluent into water courses and reduce potable water stress.
- Environmental friendly outlet for Biosolids whereby disposal to landfill is avoided.

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- Biogas as Cheaper source of electricity is found.
- Green house gas emissions is minimized.
- Public satisfaction is eventually achieved when the highest level environmental quality is maintained.
- Sustainable sewerage development could be achieved.

However, there are barriers and challenges to successful implementation of Green Technology for resource recovery in the sewerage sector. The primary barriers and challenges include the lack of funding; lack of incentive schemes; lack of economic of scale for immediate implementation of the initiatives, lack of locally acclimatized affordable technology, poor public acceptance of the recycled products.

As such, to overcome this, the following strategy and action plans need to be agreed and developed:

- Government to provide grant or funds to encourage 3R – for new waste minimization and recycling projects.
- Implement Pilot Projects to demonstrate the use of Green Technology for successful utilization of sewerage waste products to be implemented.
- Allocate Research & Development funds dedicated to encourage innovation in cheaper cleaner production of treated Bioeffluent, fertilizer and renewable energy such as from Biosolids and Biogas.
- Intensive and creative public awareness program to educate the public on recycling of sewerage by-products.
- Provide Policy & Guidelines for utilization of sewerage beneficial products such as treated Bioeffluent, fertilizer and energy source.
- Community engagement to be encouraged via small medium industry entrepreneurship program and good incentives for Green Technology projects.
- More regional plants to be established to provide the economics of scale to generate Biosolids and Biogas of critical mass.
- All regional plants shall be provided with anaerobic digestion for sludge treatment.
- Developer shall be encouraged with incentives to build Zero Waste plants.
- Integrated resource management to be advocated, planned and developed for implementation.

Figure 5 Biogas Reuse as Renewable Energy

Towards Green Technology Biogas to Renewable Energy

- **BIOGAS - Valuable source of untapped energy potential.**

- **Sustainable option to reduce consumption of fossil based electricity;**

- **Supports the Government's target towards increasing the use of renewable energy.**

Typical Biogas Characteristics

Parameters	Units	Value
Carbon Dioxide (CO ₂)	% v/v	28
Oxygen (O ₂)	% v/v	< 1
Methane (CH ₄)	% v/v	65
Moisture Content	% v/v	4
Nitrogen (N ₂)	% v/v	3

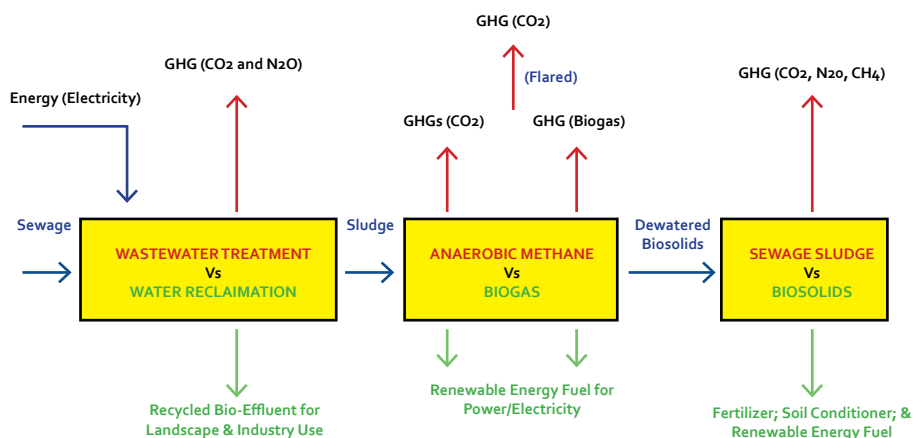


Biogas Generation Units



Power Generation Unit

Figure 6 Illustration of Green Technology Applications for The Sewerage Sector



IWK as the national sewerage services provider is well positioned to realize such new business opportunities for Malaysia. It is envisaged Malaysia can lead other emerging nations to transform sewerage services into sustainable model. For a start IWK has taken initiative to establish demonstration projects on bioeffluent reuse with government's support and is looking into biogas demonstration projects at IWK's regional plants. With further government support the vision of Malaysia as leader in sewerage transformation (Figure 7) for Asia can be realized.

Plausible scenarios were then created to enable the identification of technology priorities that is required to support the nation's vision 2020.

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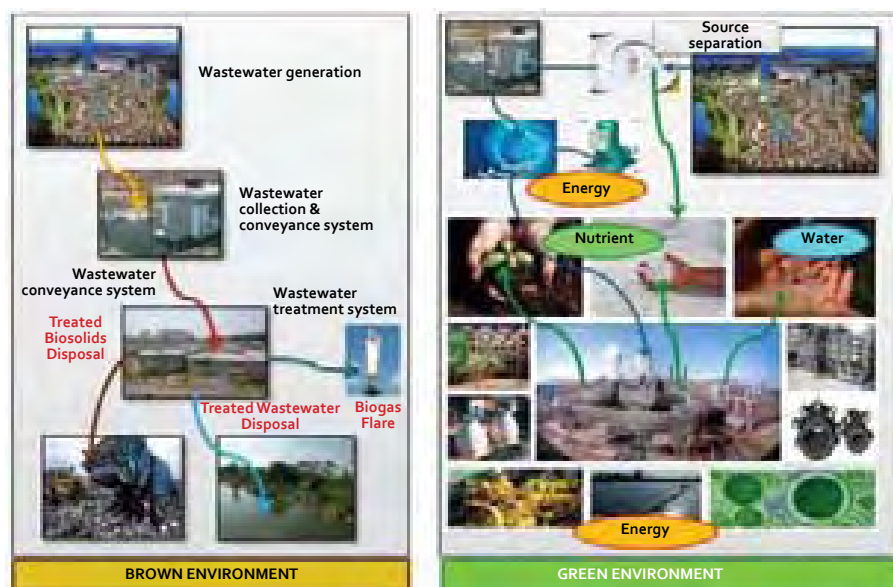
Table 1 Green Technology Methods for Resource Recovery

Sewerage By-Products	Inherent Values	Intervention Required	Green Technology Applications	Valued Added Products/Applications
Treated Effluent	Water source	Purification and Disinfection	Membrane filtration, Ultrafiltration Reverse Osmosis	Recycled water for Industries/Landscape Use.
	Nutrient Source – e.g. Nitrogen & Phosphorus; Excess Residual Pharmaceuticals	Source separation & nutrient recovery	Biotransformation and Bioaccumulation using microbes, algae and/or duckweeds Fluidized Bed Reactors	Recycled Nutrient capsules, Nutrient Feed Meal for Livestock; Recovered pharmaceuticals.
Biosolids	Organic Matter ;Macro & Micro Nutrients (i.e. N:P:K, Mg, Ca, Zn, Fe, Mn);.	Bioconversion Process	Composting & Vermicomposting	Bulk Organic Media Fertilizer
		Fortification and nutrient supplementation	Mixing and packaging	Soil Conditioner Pellets/ Briquettes; Retail Fertilizer Pellets
	Energy/Heating Value	Conversion to fuel pellets	Thermal drying	Co-firing fuel for Energy Intensive Industry
		Conversion to Hydrogen gas and eventually to electricity	Gasification Fuel Cell Technology	Renewable Energy for Power Supply
		Conversion to Biogas	Anaerobic Digestion	Renewable Energy for Power Supply
Biogas	Energy/Heating Value	Conversion to electricity	Biogas Engine & Fuel Cell Technology	Renewable Energy for Power Supply

SUMMARY AND CONCLUSION

There is enormous benefit to be gained from the application of Green Technology to harvest the much untapped resources in the sewerage sector. For this, we need to transform the manner sewerage treatment is being planned and developed in this country. Malaysia needs to leap frog our sewerage services into a zero waste, and product harvesting based on the waste to wealth model that is both environmentally and economically sustainable. With the higher vision of sewage as a resource instead of waste, the drive is to establish green technologies to produce feedstock and by-products that could be used to catalyze downstream processing to produce value added materials which have economic benefits (waste to wealth concept). In the future, it is inevitable that sewage treatment could be a lucrative business when all the stakeholders could appreciate the inherent potential in this industry. Malaysia can establish a Green Technology Hub and be a leader in this waste to wealth concept and strategize its sustainability through zero waste management.

Figure 7 Transformation From a Utility (Brown) Model to a Resource Recovery (Green) Model



BookClub

YOUNG PEOPLE, EDUCATION, AND SUSTAINABLE DEVELOPMENT: EXPLORING PRINCIPLES, PERSPECTIVES, AND PRAXIS

Peter Blaze Corcoran (Editor),
Philip Molo Osano (Editor)



- ISBN-10: 9086860931
- ISBN-13: 978-9086860937

Young people, education and sustainable development is a collection of 38 essays co-authored by 68 contributors from 25 nations, representing a diversity of geography, gender, and generation.

Young people have an enormous stake in the present and future state of Earth. Almost half of the human population is under the age of 25. If young people's resources of energy, time, and knowledge are misdirected towards violence, terrorism, socially isolating technologies, and unsustainable consumption, civilization risks destabilization. Yet, there is a powerful opportunity for society if young people can participate positively in all aspects of sustainable development. In order to do so young people need education, political support, resources, skills, and hope.

This volume offers a global perspective on education initiatives by and for young people that promote a transition to sustainability.

LEARNING FROM THE FUTURE: COMPETITIVE FORESIGHT SCENARIOS

Liam Fahey/ Robert Randall.
Publisher: John Wiley & Sons
Inc Published 1997/11



- ISBN-10: 9780471303527
- ISBN-13: 978-0471303527

How important is it to know and learn from the future?

In recent decades, the world has often been caught unaware by momentous events—oil shortages and gluts, the collapse of the Soviet empire, and technology that quickly transformed whole industries. The question is, how do we learn to anticipate and find opportunities in such sudden crises?

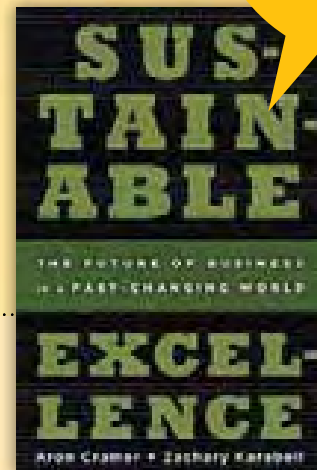
The future will always be unpredictable, but with the right techniques, it can be anticipated and managed.

Learning from the Future reveals how these innovative organizations harness imagination and strategic management techniques to create scenarios that simulate future opportunities and threats. This book makes preparing for unpredictable futures a practical part of every manager's job. It shows how scenario learning readies companies for industry and market evolutions and customers' new needs. Scenario learning envisions how industry segments may gain or lose profit potential, how certain technologies could dominate a market or fail to be accepted, how new trends could propel mass markets, what circumstances could derail a merger.

To help readers construct truly useful scenarios and learn from them, this book offers the latest insights of 25 internationally known scenario developers. Their case studies explore rapid technology innovation, regulatory destabilization, actions by new or traditional competitors, and investment opportunities.

SUSTAINABLE EXCELLENCE: THE FUTURE OF BUSINESS IN A FAST-CHANGING WORLD

Aron Cramer/
Zachary Karabell



Today's business landscape is changing: Natural resources are growing ever more scarce and expensive. Technology and changing consumer expectations are making transparency a fact of life. The rise of emerging economies creates vast market opportunities for companies—and better living standards for hundreds of millions.

In Sustainable Excellence, Aron Cramer and Zachary Karabell tell the stories of the companies who are transforming themselves by responding to these paradigm shifts and in the process shaping the future. From their work with several international companies, Cramer and Karabell know firsthand how business can successfully grapple with big-picture issues like resource scarcity, supply chain complexities, and the diverse expectations of government and the public. In Sustainable Excellence, they tell the stories of how Coca-Cola and Greenpeace collaborated on a refrigerator that fights climate change, how companies like Best Buy and Nike are transforming the very products they sell to deliver more value to consumers with less waste, how GE and Google created an innovative partnership that is developing "smart grids" that radically reduce energy use, and how business leaders like Starbucks' founder and CEO Howard Schultz put sustainable excellence at the center of his company's business strategy.

Through these and other fascinating stories Sustainable Excellence makes the case for a different way of doing business – one that will define both business success and economic vitality in the 21st century.

Growing Together – Future Forum 2020

A Foresight Project for Natural Fiber



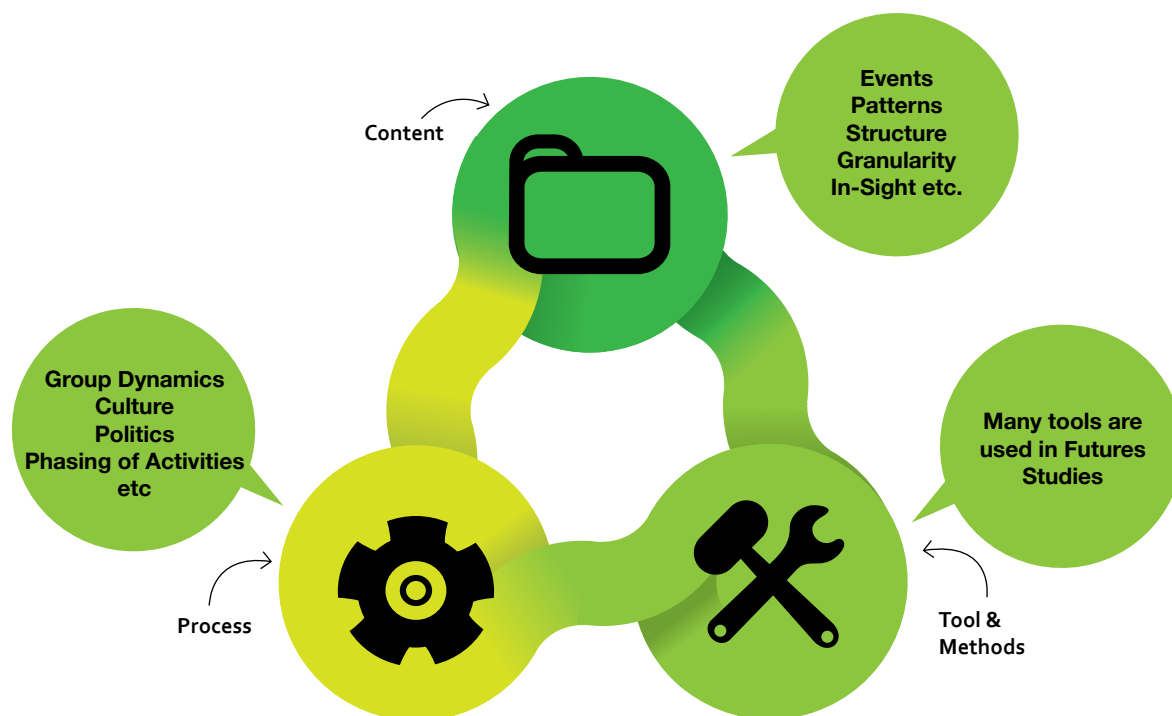
BY
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Figure 1 Need to Balance Contents, Processes and Tools & Methods



“The key reasons for the decline of these fibers could be attributed to lack of proactiveness and neglect of innovation. The producing countries often considered each other as competitors and were not able to find areas where consensus could be developed and collective action made possible.”

THE INTERNATIONAL NATURAL FIBER ORGANIZATION

Growing Together – Future Forum 2020 is a Foresight project of the International Natural Fiber organization (INFO).

INFO is a Public-Private-Partnership of fiber producers from emerging economies and developing countries such as Brazil, Bangladesh, India, Philippines, Sri Lanka, and Tanzania. INFO was officially incorporated as an international association in the latter part of 2009. Recently the Malaysian Kenaf sector showed keen interest to support INFO activities and generously hosted the 2nd workshop of this 12 month Foresight project, which was held from 16 to 18 March in Putrajaya. The 1st international workshop was held in Leiden, The Netherlands. The Foresight project is facilitated by Prof. Ian Miles and Dr. Ozcan Saritas of Manchester Institute of Innovation Research, Manchester Business School, U.K.

The objectives of INFO are:

- (1) Contribute towards income improvement and market position of natural fiber

producers. The fiber producers are mainly rural famers and with low income levels, mostly in emerging economies and developing countries

- (2) Contribute towards Sustainable Societies by encouraging the use of natural fibers on route to Bio Based Economies, this taking into account the concept of Planet, People and Profits.
- (3) Contribute towards Biodiversity.

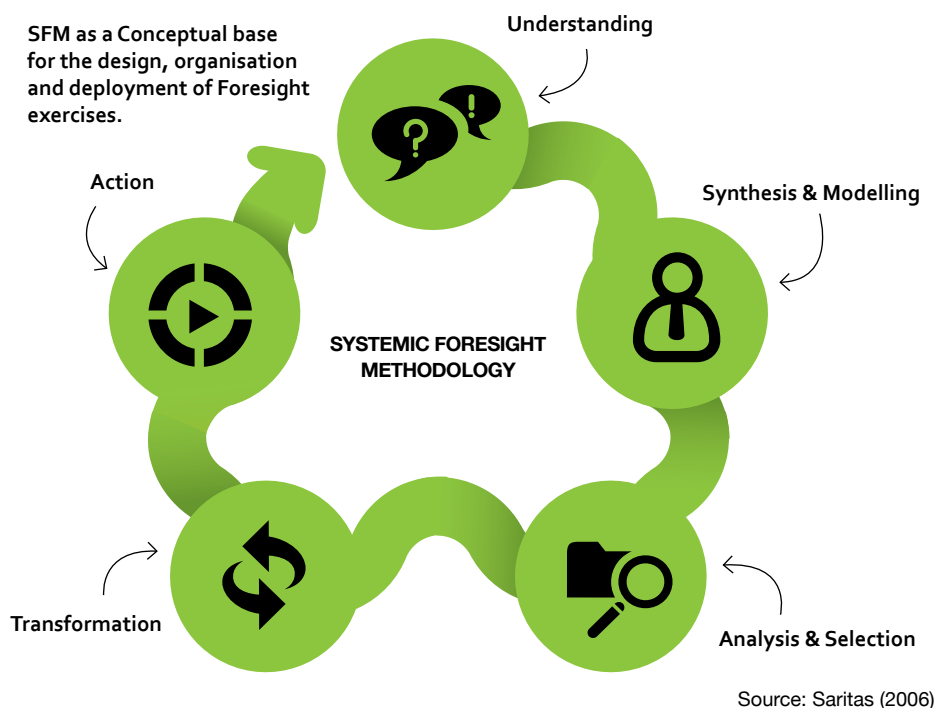
INFO works closely with the FAO Inter-Governmental Groups on Hard Fibers, Jute Kenaf and Allied Fibers. At present the focus is on natural fibers Abaca, Coir, Jute, Kenaf and Sisal.

COOPERATING TO COMPETE

Millions of people and thousands of households and farmers are dependent on the production of Abaca, Coir, Jute, Kenaf and Sisal fiber, often under conditions of poverty and living in rural areas. In a period where sustainable development is a key issue, renewable materials such as these natural fibers lost market share. Looking backwards the explanations for this state of business can be given but what about the future? How will the

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Figure 2 Systemic Foresight Methodology (SFM) and its mental acts (phases)

**1 Systemic understanding**

Creates shared understanding and mutual appreciation of issues at hand

2 Systems synthesis and modelling

The input from scanning is synthesised into conceptual models of the situations involved in the real world

3 Systemic analysis and Selection

Analyses the alternative models of the future and 'prioritises' them, through intensive negotiations among system actors and stakeholders, to create an agreed model of the future

4 System transformation

Establishes the relationship between the future and the present for a change programme

5 Systemic action

Create plans to inform present day decisions for immediate change to provide structural and behavioural transformations

cultivation and production of these fibers look in the year 2020?

The key reasons for the decline of these fibers could be attributed to lack of proactiveness and neglect of innovation. The producing countries often considered each other as competitors and were not able to find areas where consensus could be developed and collective action made possible. In a classical behaviour, the "outside world" was blamed for the state of affairs. Particularly the "Synthetics" were seen as the main culprit.

Around 2007 it became apparent to a group of producers that there was much to be gained by cooperating than destruction competition. For instance cooperation meant limited resources could be shared, learning from each other encouraged, collective R&D activities undertaken to accelerate the development of the sectors and energies focused to making a start in recovering the lost market share. But in order to be effective the group considered a collective long term vision is considered vital. Therefore instead of developing a plan based on the traditional Strategy Management approach, a Foresight approach was chosen.

THE FORESIGHT PROJECT: THE COMPLEXITIES FACED DUE TO GROUPS DIVERSITY

Generally the minimum time horizon of Foresight is considered to be 10 years or more and this can cause methodological and also process challenges. This is even more true to INFO which is an international group of senior level policy makers and business managers representing a wide range of fibers. Most are used to day to day management practice of "Fire Fighting" and less busy with thinking 20 or 30 year ahead. So change in mind set becomes essential for this Foresight activity. In addition, not many in the INFO group are familiar with the concepts and tools of Foresight. Similarity of vocabulary of Foresight and Strategy Management could be misleading as well. This is especially true for INFO members who may undertake Strategy Management in Small and Medium Sized Enterprises.

So Growing Together – Future Forum 2020 is not only intended to produce a Foresight report (contents) but the process is an equally important component. In the project the 3 aspects of Contents, Processes and Tools & Methods of Foresight need equal attention. See [figure 1](#).

The challenge in this project is to keep all three components in balance to ensure success of the project. The time factor of the project of 12 months, geographical dispersion, limited funds and resources can add to the challenges of this project.

This makes Growing Together – Future Forum 2020 a special foresight project.

METHODOLOGICAL CHALLENGES

In Growing Together – Future Forum 2020, Prof. Ian Miles and Dr. Ozcan Saritas of Manchester Business School are following the systemic foresight methodology as shown in [figure 2](#).

In each of these components a mix of methods could be used for analytical purposes. As the project progresses it is becoming apparent that there are no prescriptions for finding the right mix of tools to be used in each component. This obviously is a trade-off between costs and time, meaning if there are sufficient funds and time data can be generated to enable analysis.

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According to Saritas (in Concept report of Growing Together- Future Forum 2020, 2011) a typical Multi-Method approach is illustrated in **figure 3**.

However, due to the complexity of the project, how the methods per step can be mixed seems to be more intuitive than systematic. In the coming months this aspect will be explored further.

GROWING TOGETHER – FUTURE FORUM 2020: THE BENEFITS SO FAR

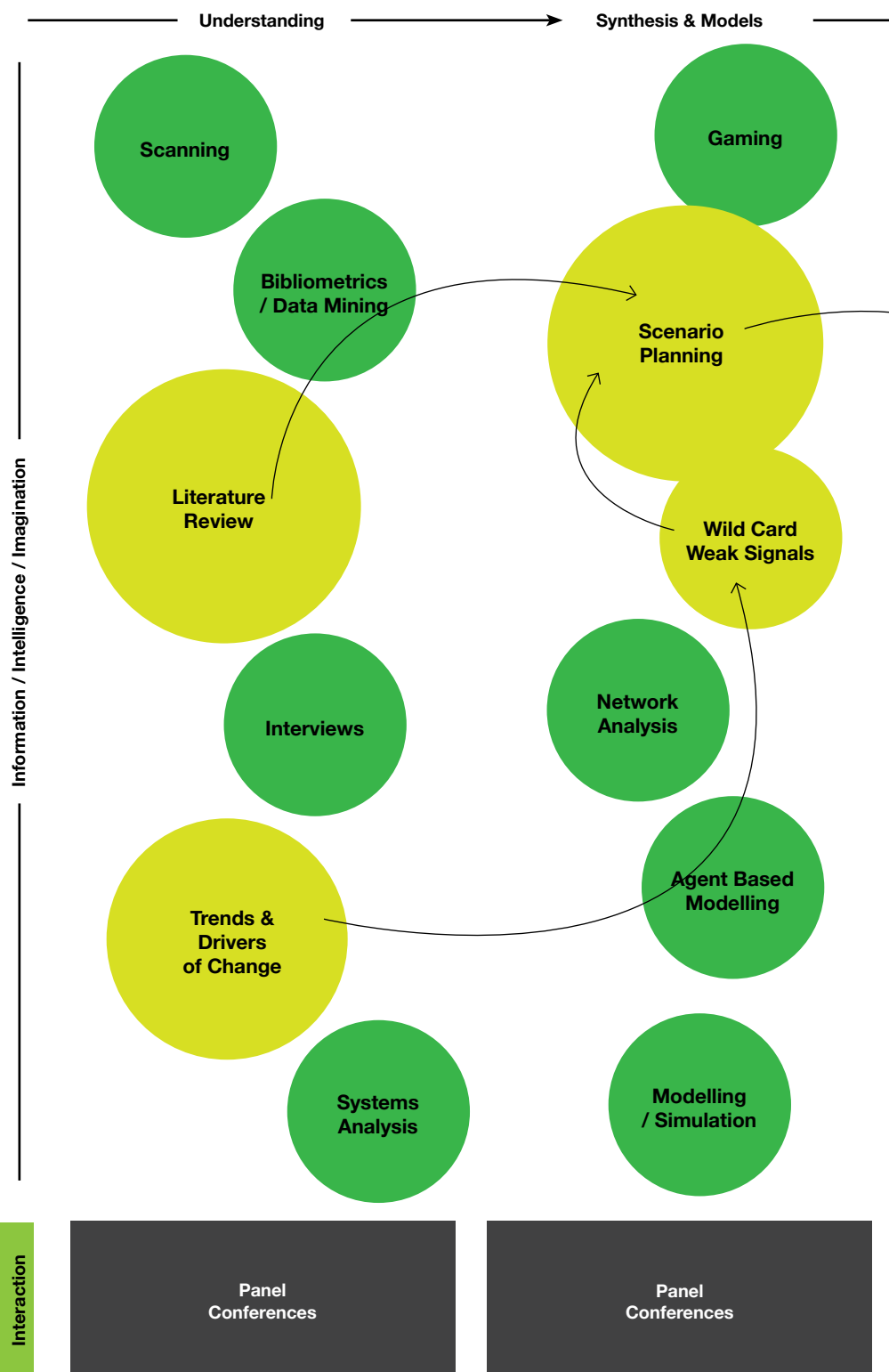
According to the planning the 1st phase of this Foresight project will conclude in the 4th quarter of 2011. It is the intention of INFO to institutionalize and embed Foresight thinking within the INFO member countries. This network should enable to increase the efficiency of applying Foresight activities in future.

This foresight project has already achieved its objective of bringing a diverse group of international policy makers and business managers together and focus their thinking on the more longer term issues but still respecting the diversity of view points. The value of Foresight approach in creating a common long term vision for the natural fibers of concern to INFO is becoming apparent as the project progresses.

The key objective of the foresight is to understand the long term futures that could unfold upon the different fibers and collective action planned and implemented by INFO for the common themes that will emerge. It is also envisaged that the outcome this project and the experienced gained will encourage the different INFO participants to use foresight for individual countries policy making.

“The key objective of the foresight is to understand the long term futures that could unfold upon the different fibers and collective action planned and implemented by INFO for the common themes that will emerge.”

Figure 3 Classification of Foresight methods and Illustration of Multi-Method Approach



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The Challenges of Research in Malaysia: Prioritisation of Research and Bringing Research to the Market



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Research and Development (R&D) has long been a key activity in any developing or developed nation. R&D activities are not only generators of new knowledge; they are also an essential factor in the growth in the economy. The government of Malaysia has long recognised this fact, and has worked hard to foster and nurture collaborations between researchers and the members of the industry, thereby allowing individuals to come together in new or larger research groups as well as to initiate and practice interdisciplinary research, as well as to work together with the members of the industry to promote research that addresses specific market needs.

In a developing country such as Malaysia, there are many challenges when it comes to conducting research. One of the main challenges being faced is the needs of the public. To illustrate this point, let us first take for granted that the entire nation's R&D is relevant to the needs of the industry; thus the question will be of prioritization of the efforts in research. This prioritization could differ depending on situation(s) surrounding a particular state, sector or community; in some cases the research would be on the betterment of the social situation, whilst in other cases the research can be used to boost the economy. It is not easy to accurately determine which role would best suit the research, but an inference of where to place the prioritization for R&D can be based on a few indicators such as the GINI Ranking and the Gross

Domestic Product (GDP). Should the GINI ranking, a measurement of wealth distribution should be uneven then prioritization could be or rather should be for towards state funded social programs, with less focus on funding for research activities. Or if the GDP is well below critical mass, focus might be applied to low value chain activities to drive the economy. However, based on the dependency of export (an indication of how insulated the economy is), more resources could be allocated towards research and development. Suppose say we are a small community living on Mars, the pressure towards improving our comparative advantage or to add to our capabilities could be less, thus allowing us to focus on different paths. Based on our current standing in the World Economic Forum competitive ranking (we rank 26th), we can see that we are still efficiency driven economy and not yet innovation driven. This infers that the goals and the priorities of the nation should and are still focused on the development of many aspects of the nation, not including research and development. Furthermore, Malaysia's patent performance is at 5.7 utility innovations per million (population) (2009), not surprising since the percentage of GDP for R&D stood at 0.64%

of GDP as of 2006. The debate to increase, decrease or leave alone this percentage again falls on the prioritization of the nation, where subsidization or expenditure for the research and development should be balanced with subsidization or expenditure for the public. In simple terms the challenge is: to increase research output (inclusive innovation and products) without skewing wealth distribution.

Another key challenge in research in Malaysia is in bringing it into the market. For the foresight and future of any nation, the ability of research outputs to penetrate the market is a key factor that spells the success and stability of a nation, or its slow decline. The main reason for this is that system integrators and product developers are most of the time reluctant to introduce new locally developed technologies into their wares. This is justifiable, as these entities must ensure the performance of their products and the satisfaction of their customers, but it is also a bane to the research output, as it will never be able to see real-world applications. The government has taken efforts to overcome this problem by preparing various funds such as technology grants (MGS,

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Technofund,) matchmaking grants (*IP Connect MDeC* – where patents holders meet the industry, *Agensi Inovasi Malaysia Commercialisation Lab* – where patent holders present their innovation to industry for further development and *Universities Commercializing Arm* – where universities try to find an industrial match for a particular core technology) and have produced some results, but sadly the response is rather lethargic. The reasons for this ranges from low short term returns to perceived risks involved. Overcoming this challenge will require the most effort, which is a change of mindset. Because this can be almost impossible to achieve, an alternative route must be found; in this case, a collaborative synergy can be achieved by having a collaboration between the researcher and the industrial entity, such that the research is focused to solve a specific industry problem which can then be taken up by the industry entity. This is not only important but in actual fact crucial when we compare ourselves to giant global entities such as HUAWEI and ZTE who have very strong research groups. Additional factors that inhibit the movement of research outputs to the market are:

1) Mismatch of Expectations

Researchers from RI's or University have an expectation that the method used must be highly efficient (depending though on how efficiency is defined) and novel, but not necessarily to improve the bottom-line of user-experience. This contradicts with the needs of the industry, who want a simple solution that is user friendly.

2) Breakdown in Communication

There must be an understanding of how to measure performance, and for motivational purposes the pros and cons of one method of measurement over another must be clear. Both

the researcher and the industry member must be competent to improve communications and to smoothen the transfer of knowledge.

3) Areas of Contention

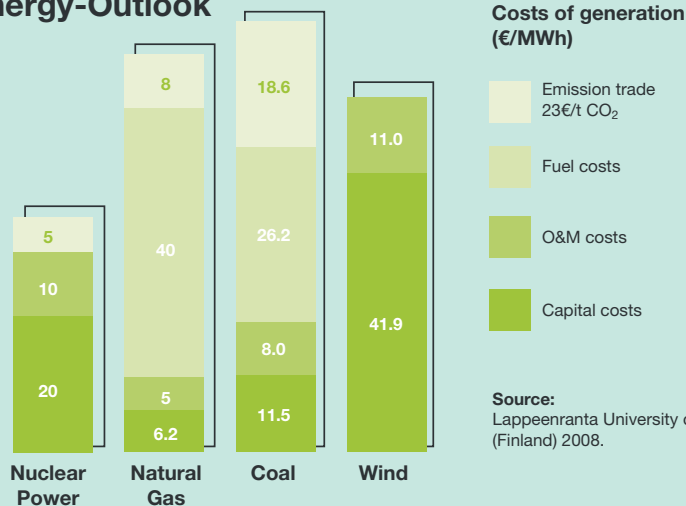
Once there is a perceived profit to be made from a collaborative effort, then there will be two areas contention of conflict between RI's/ University and Industry, namely IP (Patent) and Profit Sharing; especially ones that are derived by the new contented IP (Patent).

Although these factors do not constitute the only stumbling blocks in bringing research outputs to

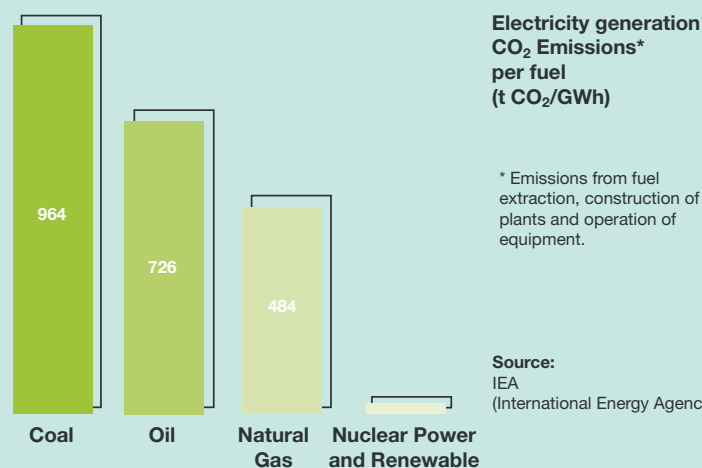
the market, they do represent the largest ones and must be resolved before any significant results can be seen from the movement of research to the market.

In solving these issues, policies, regulations and legalities as well as basic human empathy go a long way. It is not difficult to conduct research in a country while at the same time ensuring the growth and prosperity of the people; all it takes is a concentrated effort by all parties, the industry the government and the researcher, and in doing so, would be able to see Malaysia in becoming a developed nation in the near future.

Energy-Outlook



Carbon Dioxide Emissions



This is justifiable, as these entities must ensure the performance of their products and the satisfaction of their customers, but it is also a bane to the research output, as it will never be able to see real-world applications.





GREENING THE FUTURE

Through Malaysian Biomass Initiatives (MBI)



BY
NIK AHMAD FAIZUL ABDUL MALLEK
PUVANESWARY RAMASAMY

Palm oil has contributed to the world oils and fats supply and demand equation mainly due to its techno-economic advantages and versatility as well as some of the developments in the world in relation to security and supply, health, and environment. It is expected that the world palm oil consumption will increase from the current 38 million tonnes to 63 million tonnes in 2015 and further increase to 77 million tonnes in 2020 (Mielke, 2011).

Malaysia is the 2nd largest Crude Palm Oil (CPO) producer with 17.5 million tonnes of CPO in 2010 and it is expected to achieve 21.5 million tonnes. As of 2009, Malaysia has 4.7 million hectares of oil palm plantations, 416 mills, 43 crushers, 51 refineries, 18 oleochemical plants and 25 biodiesel plants. The industry is dominated by large plantation companies (Private- and Government-linked companies) which hold 60% total plantation land, with growing level of integration along the value chain (Table 1).

CONTEMPORARY BIOMASS UTILIZATION

As a result of this, the residue/waste from palm oil plantation is known to a major contributor to biomass in the country. It is estimated to be more than 90 million tonnes per year largely derived from empty fruit bunches (EFBs), trunks, fronds, shell, and palm kernel cake (Table 2). Currently the dry biomass is being converted to low-value wood products, fertilizers, aggregates, and fuel pellets/briquettes. Some are burned at the mills to produce in-house energy supply (Figure 1). A considerable amount of our empty fruit bunches are also being exported out to other countries (such as Japan & EU) (Table 3) where value is created overseas. In addition to this palm-oil mill effluents (POME) are utilised to produce biogas which is then used to generate electricity. With the introduction of the feed-in-tariff mechanism, the effort to generate electricity from biomass is expected to gain momentum.

FUTURE SHIFT

Recent findings have highlighted that palm-based biomass can be utilised for more valuable resources, such as the production of biofuels, biochemicals, phytonutrients and other high-value fine chemicals (Figure 2 & 3). These phytonutrients include Carotenes, Vitamin E, Sterols, Squalene, Co enzyme Q and Phospholipids. These phytonutrients are powerful antioxidants, but their value extends beyond antioxidant activity and free radical protection. They have also been

shown to have extensive health benefits such cardiovascular benefits (Strandberg et al., 1989) and even anti-cancer properties. Biochemicals include sugar derivatives such as succinic acid which is now used within the food and beverage industry, primarily as a sweetener. Other high value fine chemicals include plasticizers such as levulinic acid, bio-isobutanol, and bio-n-butanol which can also be involved in the solvents, foam, coatings, and jet-fuel industries (Table 4).

In-light of this issue, biomass utilization is gaining popularity due to its considerable potential. It is renewable, and is already the fourth largest global energy resource after coal, oil, and natural gas. It has the capacity to penetrate all energy sectorial markets, although economic constraints still limit its general deployment. (bioMass.sp Newsletter Issue 1). In addition to this by enhancing and optimising the current usage of biomass to produce fine chemicals, biochemical, and biofuels, it can tap into a much more lucrative market and contribute significantly to Malaysia's GDP while addressing environmental issues at the same time (Table 5). Thus it seems that Malaysia's oil-palm biomass is the right champion to jump-start Malaysia into an

era of Green Economy, hence towards a greener future.

ENABLING PLATFORM

The recently established Global Science and Innovation Advisory Council (GSIAC) by Malaysia's Prime Minister, Datuk Seri Najib Tun Razak in New York has Malaysian Biomass Initiatives as one of the 3 quick-win projects. Through the leading efforts of MIGHT as the Secretariat, various national parties¹ were consolidated such as MOSTI, EPU, KeT HA, NRE, UNIK, PEMANDU, Biotech Corp, MLSCF, bioMass.sp, MPOB, MDEC, MITI, MIDA, Green Tech Corp, ASM, Ensearch, WWF, and many others to formulate a plan for green futures for Malaysia. Through the GSIAC, the concerted efforts of MIGHT, and consolidation from other national parties in the spirit of 1Malaysia, the best framework to ensure the success of the Malaysian Biomass Initiatives (MBI) was created (Figure 4).

Table 1 Plantation areas in Malaysia (by category)

Categories	Areas (Hectares)	%
Private Estates	2,934,519	60.5
- Sime Darby ¹	639,000	
- IOI ²	154,709	
- KLK	178,939	
- Boulstead	74,354	
- Others	1,887,517	
Felda	705,574	14.5
Smallholders	651,385	13.4
State Agency	320,940	6.7
Felcra	162,556	3.3
Risda	78,791	1.6
Total	4,853,766	100

Source: ¹ MPOB 2011; ² IOI Corp. Bhd. Annual Report 2010

Figure 1 Current utilization of Malaysia's oil-palm biomass

Source: MIGHT, 2011

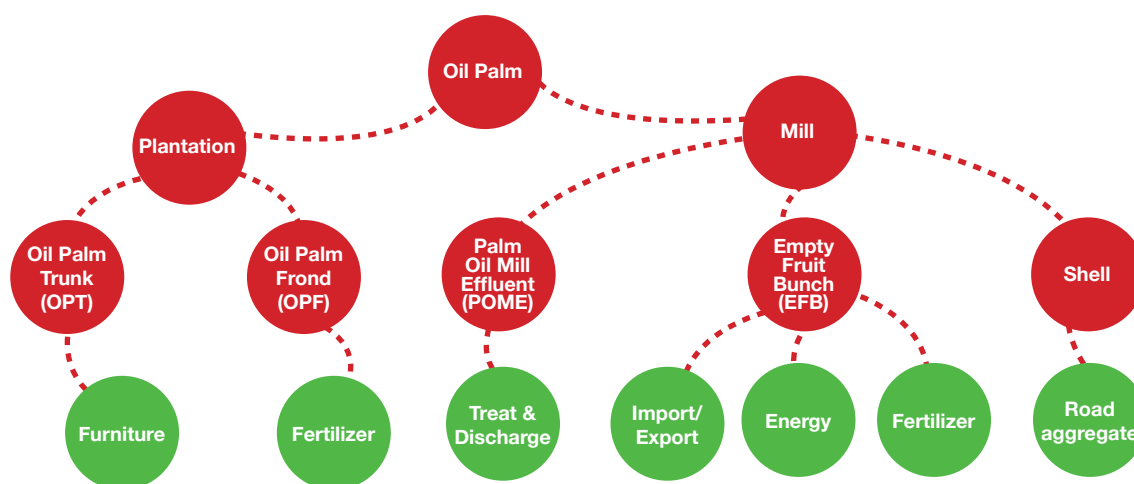


Table 2 Biomass output capacity of Malaysian oil-palm industry

Note: Item 3-7 are dry biomass. 'Others' refer to oil palm plantation outside the ECER region. ECER + others represent national plantation.

	2008 (ECER) (TONNES)	2010 (Others) (TONNES)	Total Dry Biomass (ECER + Others)
1. Empty Fruit Bunches	2,379,811	11,849,002	
2. Shell	855,817	42,610,835	
3. Palm Kernel Cake	541,740	2,697,307	
4. Oil Palm Trunk	5,100,000	5,100,000	
5. Oil Palm Fronds	4,748,700	23,643,546	
6. Total Dry Biomass	13,626,068	85,900,690	99,526,758
TONNES/YEAR			
7. Palm Oil Mill effluent	9,081,889	45,218,280	

Source: MIGHT, 2011

Table 3 Example companies in Japan importing EFBs from Malaysia.

Trader and/or User	Scope and Purpose of EFB Business
Tokuyama Co. (User)	Began to use EFB as fuel for the boiler of the factory's power generation plant, burning EFB with coal at a proportion of 10 %, since October 2009 at Tokuyama Factory. Plans to consume 30,000 ~ 40,000 ton of EFB annually, expecting to reduce CO2 emission by 70,000 ton annually
ORIX Co. (Trader)	Secured an import allotment of 500,000 ton/year of EFB from Malaysian and Indonesian firms. Intends to supply 100,000 ~ 200, 000 ton/year of EFB to Japanese electric power companies and paper-manufacturing companies, expecting sales amount of 1 ~ 2 billion yen/year. Further, increase import up to 1 million ton/year in the future
Itochu Co. (Trader)	Established in November 2009, a joint venture company that would produce solid type fuel from EFB, jointly with Felda Palm Industries Sdn Bhd (FPISB) that is the biggest palm oil maker in the world. Annual production of the solid fuel would be 24,000 ton, which would be exported to Japan and consumed by Tokyo Electric Power Company from 2012. Plans to raise the annual production of the solid fuel up to 120,000 ton/year

Source: Asia Biomass Office; retrieved from the World Wide Web, 2011

Figure 2 High-value conversion

Source: 2011

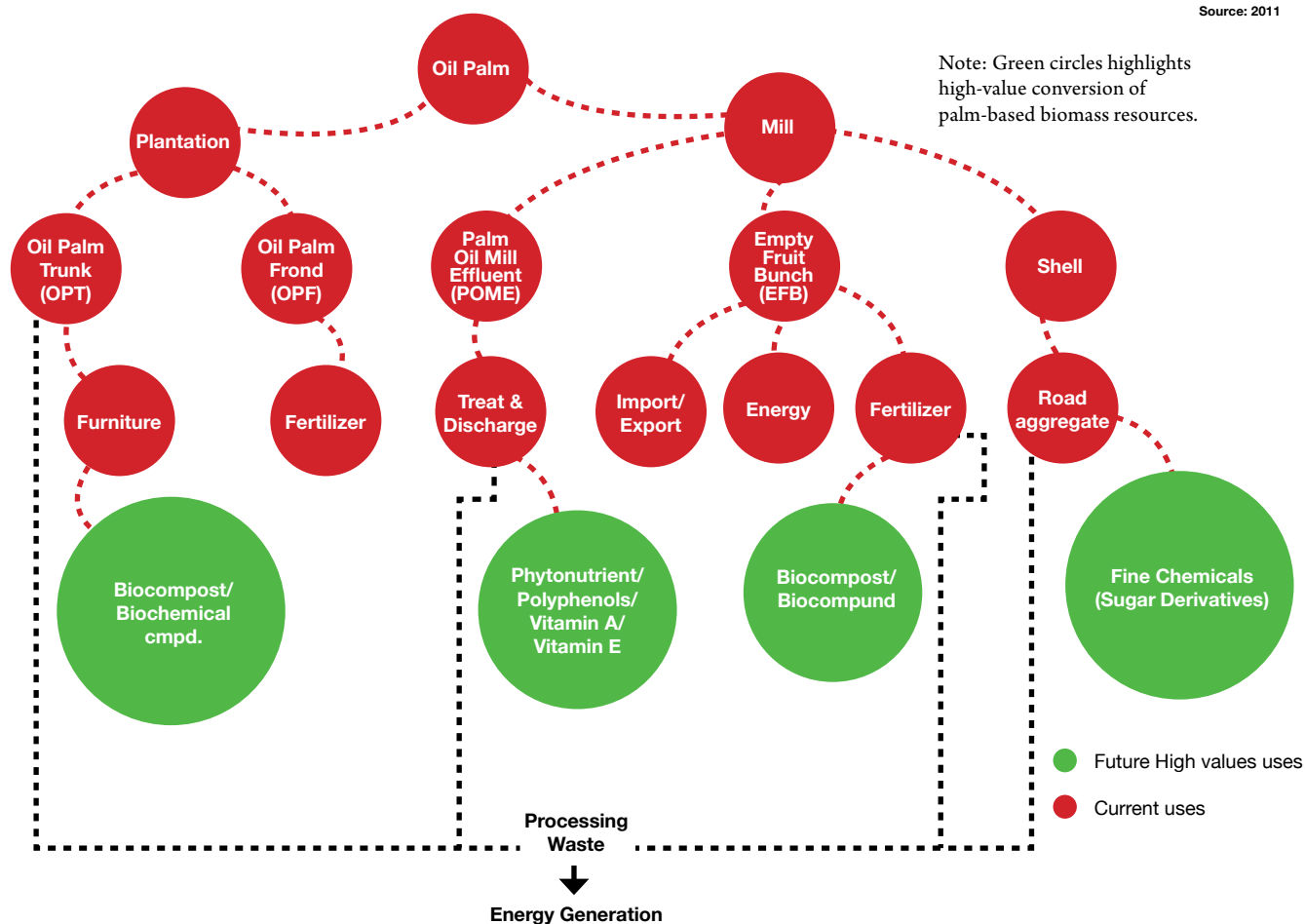
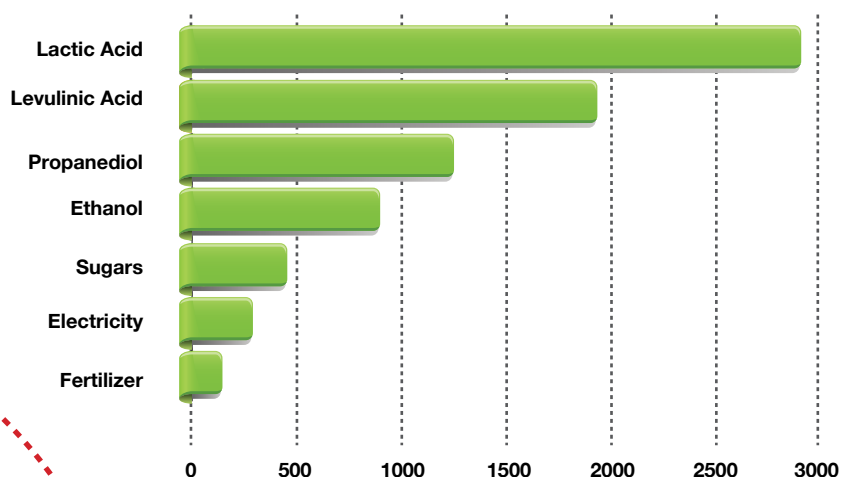


Figure 3 Value Generated per Dry Tonne Biomass

Value Generated per Dry Tonne Biomass (RM)



MALAYSIAN BIOMASS INITIATIVES

The MBI is based on public-private partnership (PPP) model and operated by an entity where sub-entities of the MBI (such as a Special Purpose Vehicle for Aggregation, Consortia etc.) will play the crucial role of long-term sole purchaser and supplier of palm waste biomass. Other responsibilities of the MBI and its sub-entities include ensuring the reliable and sustainable supply of biomass (from feedstock to off-takers), coordinating the optimization for quality and cost of client processes, and integrating global technologies to provide fractionated biomass components. In addition to that, the MBI also has capacity-building elements whereby the GSIAC platform may serve to provide input to the related Centres of Excellence (COEs) in Malaysia especially where relevant technologies in the MBI are concerned. Thus, the MBI aims to be a clear, concerted and well-structured intervention solution for a sustainable and manageable initiative in catalysing and optimizing Malaysia's ready supply of biomass towards realizing downstream economic opportunities in the oil-palm industry. The MBI, along with

government intervention may accelerate the nation into greener economies by facilitating a vibrant and conducive environment.

GSIAC

A Malaysian delegation visit to US was headed by YAB Prime Minister from 25 to 30 September 2010 and one of the announcements made during the visit was the setting up of the Global Science and Innovation Advisory Council (GSIAC) for Malaysia in New York.

GSIAC is structurally chaired by the Prime Minister, with Dato' Dr. Zakri Abdul Hamid (Science Advisor to the Prime Minister) and Ellis Rubinstein (President and CEO of the New York Academy of Sciences) being the Joint-Secretaries, while Mohd Yusoff Sulaiman (President and CEO of MIGHT) and Dr Karin Pavese (Vice-President, Innovation & Sustainability, NYAS) takes the role of the Joint-Secretariat Heads (Figure 5). GSIAC members also consist of highly-selected ministers, corporate leaders and academics – Malaysia & New York Academy of

Sciences President's Council Members (Table 6).

The objectives of the council include providing advice on Malaysia's aspirations of being a high income country through wealth creation and societal well-being, benchmarking Malaysia's ranking and competitiveness in Science and Innovation against technologically advanced countries and improving Malaysia's capabilities in Science and Innovation. Last, and not least, the GSIAC (and its associated projects) also aim to generate and increase bilateral trade and investment value for short, medium, and long-term timeline.

Since the successful GSIAC inaugural meeting in New York on the 17th of May 2011, the GSIAC and its associated three endorsed projects (namely MBI, Smart-City Smart Village, and Capacity Building) have gained much publicity from local and international media and the interest momentum is expected to rise throughout the project timeline.

The Council is deemed a crucial added value to the efforts of the Malaysian Government to make a quantum jump from middle-income country to a high-income economy by the year 2020.

Table 4 Example of high-value chemicals that can be produced from oil-palm biomass

Product	Application	Value-add/ tonne product
Proprietary platform chemical, L-ketals	High-value specialty chemicals & materials	USD500-3,000
Bio-isobutanol	High-value specialty chemicals, plastics, materials & 'drop-in' fuels	
Bio-n-butanol	High-value specialty chemicals e.g. solvents, acrylics; jet fuel	

Source: MLSCF, 2011

Table 5 Conversion of palm-based resources to Bioelectricity, Biofuels, and Biochemicals and projected GDP contribution

	Estimated Revenue	Projected GDP - Contribution
	Per MT	Billion RM (%GDP)
1. Bioelectricity	RM 231	0.8 (0.1%)
2. Biofuels*	RM 453	3 (0.5%)
3. Biochemicals**	RM 2500	26 (4.2%)

Source: UNK, 2010

Notes:

Based on 70 million tons of palm lignocellulosic residue

Margin: 5% (electric), 10% (fuels), 15% (chem's)

*ethanol, **lactic acid for plastic

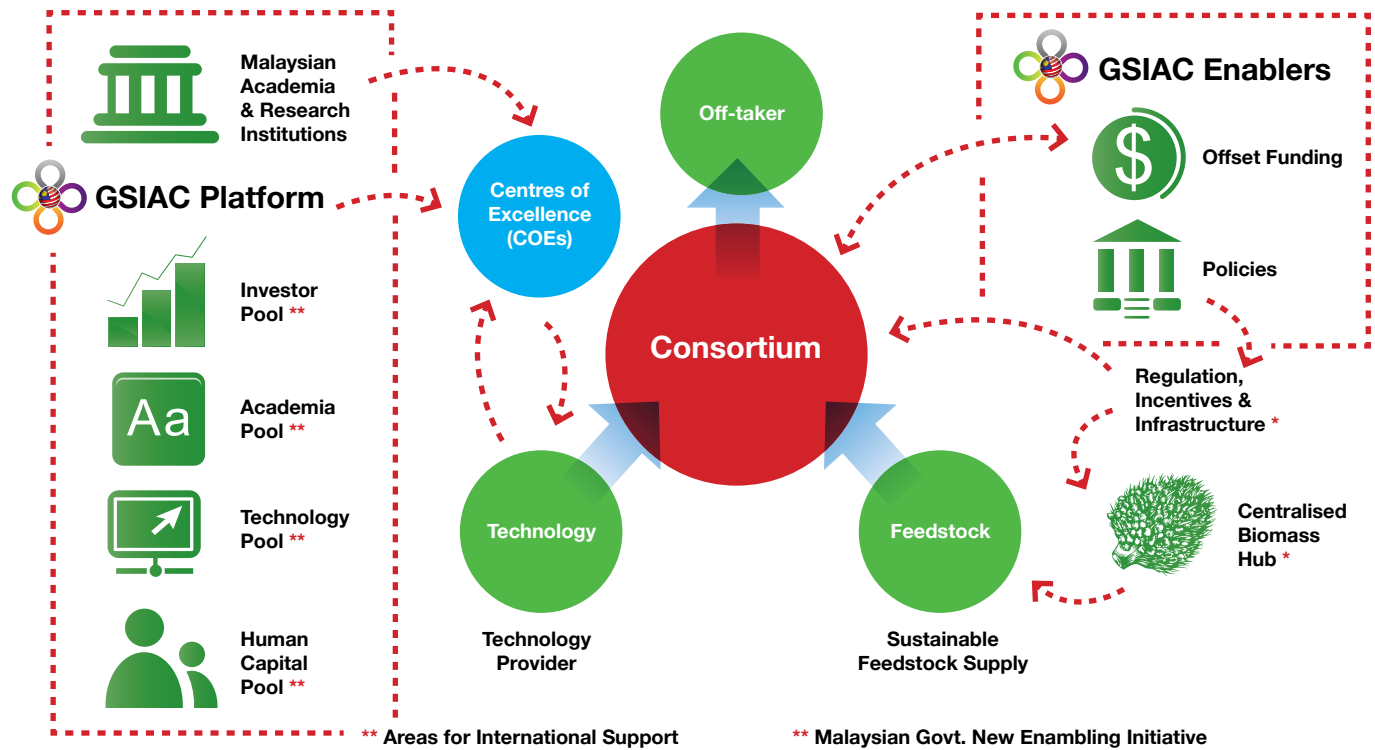
MY GDP = 195 billion USD

WAY FORWARD

Malaysia's oil-palm biomass is truly an untapped reservoir. Utilization of biomass can be both green and wealth-creating. Capitalizing on our abundant renewable resource and driven by the need to grow sustainably, The MBI is projected to generate an additional income of RM 100 billion or more to the Malaysian economy with the addition of creating highly skilled and semi-skilled jobs. The Malaysian Biomass Initiative, along with other projects such as the Smart City-Smart Village project is set to jump-start a vibrant green technology in Malaysia, and drive Malaysia into a new era of Green Economy, ultimately propelling the nation into a Green Future.

1 MOSTI, Ministry of Science, Technology & Innovation; EPU, Economic Planning Unit; KeTTHA, Kementerian Tenaga Teknologi Hijau dan Air; MNRE, Ministry of Natural Resource & Environment; UNIK, Unit Inovasi Khas; PEMANDU; Biotech Corp; MLSCF, Malaysian Life-Science Capital Fund; bioMass.sp; MPOB, Malaysian Palm Oil Board; MDEC, Malaysia Development Corporation; MITI, Ministry of International Trade and Industry; MIDA, Malaysian Industrial Development Authority; Green Tech Corp; ASM, Akademi Sains Malaysia; Ensearch; WWF, World Wide Life Foundation.

Figure 4 MBI Implementation Model



Source: MIGHT, 2011

Figure 5 Structure of the GSIAC

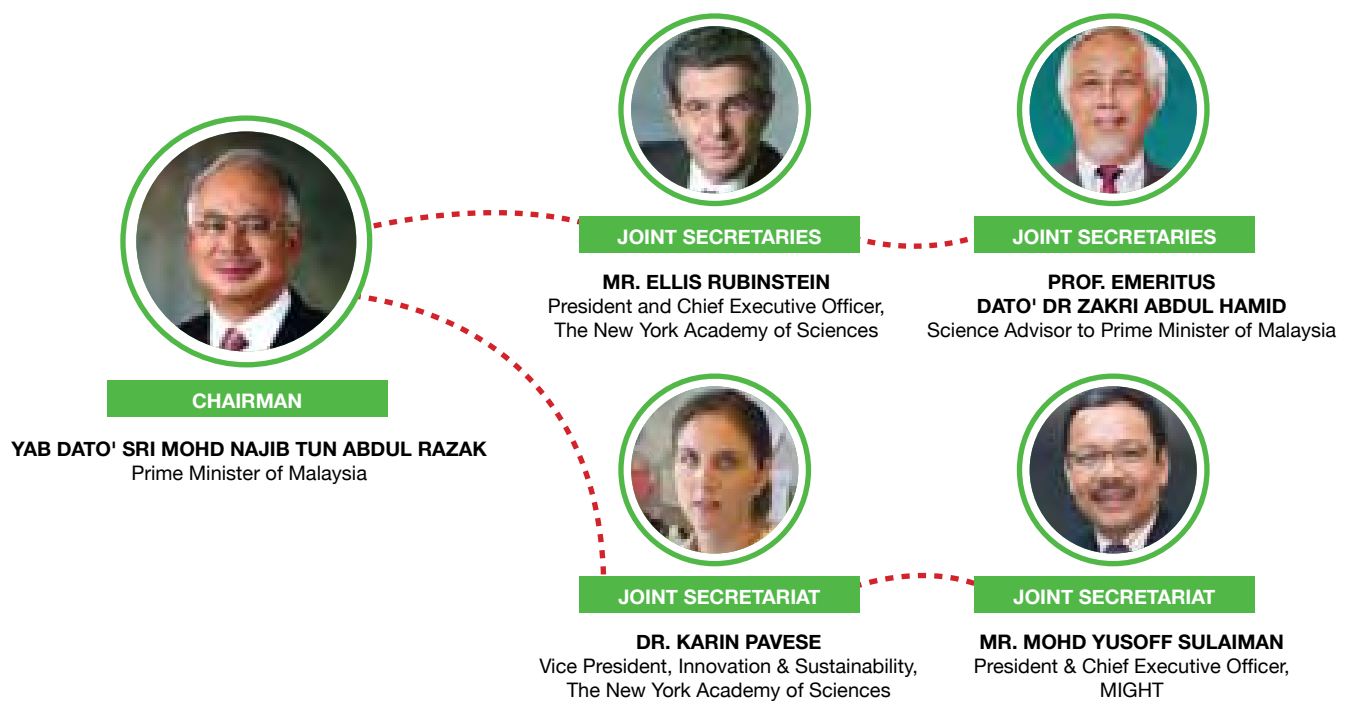


Table 6 GSIAC Members

GSIAC MEMBERS

INTERNATIONAL MEMBERS

- **Dr. Rita Colwell**, US Special Science Envoy to South Asia and Southeast Asia
- **Mr. Ron Cohen**, President & Chief Executive Office , Accordia Therapeutics
- **Dr. A. A. (Aalt) Dijkhuizen**, Chairman, Executive Board, Wageningen University and Research Centre
- **Dr. Michael Crow**, President, Arizona State University
- **Dr. Mikael Dolsten**, President, Worldwide Research and Development and Senior Vice President, Pfizer Inc
- **Dr. Paul Horn**, Senior Vice Provost for Research, New York University, former Senior Vice President & Executive Director of Research, IBM
- **Hon. Jerry MacArthur Hultin**, President, Polytechnic Institute of New York University
- **Mr. Jiang Mian Heng**, Vice President, Chinese Academy of Sciences; President, Shanghai Branch of CAS
- **Dr. Kiyoshi Kurokawa**, Professor, National Graduate Institute for Policy Studies, former Science Advisor to the Prime Minister of Japan
- **Dr. Rajendra K. Pachauri**, Director General, The Energy Research Institute (TERI), New Delhi, Chair International Panel on Climate Change (IPCC)
- **Hon. Ilya Ponomarev**, Member, DUMA of Russia, Chair, DUMA High Technology Committee
- **Dr. Richard Roberts**, Nobel Laureate, Chief Scientific Officer, New England Biolabs
- **Dr. Jeffrey Sachs**, Director of The Earth Institute, Quetelet Professor of Sustainable Development, and Professor of Health Policy and Management at Columbia University, Special Advisor to the Secretary General of the United Nations
- **Dr. Annalee Saxenian**, Dean and Professor, School of Information, University of California, Berkeley
- **Dr. Franklin Schuling**, Vice President Philips Research and Head of Philips Research North America
- **Dr. Anthony J. Sinskey**, Prof. of Biology & Health Sciences & Technology, M.I.T.
- **Dr. Vivek Wadhwa**, Senior Research Associate, Labor and Worklife Program at Harvard Law School, Executive In Residence/Adjunct Professor, Pratt School of Engineering at Duke University, and Visiting Scholar, School of Information, University of California, Berkeley
- **Dr. Torsten Wiesel**, Nobel Laureate, President Emeritus, Rockefeller University, Chairman Emeritus, The New York Academy of Sciences
- **Dr. Roger Wyse**, Managing Director, Burrill & Co.
- **Dr. Nancy Zimpher**, Chancellor, The State University of New York
- **Sir Peter Williams**, Vice President, Royal Society, United Kingdom
- **Dr. June Seung Lee**, President, Korea Institute of Science & Technology Evaluation and Planning (KISTEP)
- **Professor William F. Miller**, Herbert Hoover Professor of Public & Private, Emeritus Professor of Computer Science Stanford University, former President & CEO of SRI International
- **Mr. Brian Mefford**, Chairman and Chief Executive Officer of Connected Nation, Inc
- **Mr. Steve Forbes**, Chairman and Chief Executive Officer of Forbes Media.



Table 6 GSIAC Members (cont)

LOCAL MEMBERS

- **YB. Dato' Sri Peter Chin Fah Kui**, Minister of Energy, Green Technology & Water
- **YB. Datuk Seri Dr. Maximus Johnity Ongkili**, Minister of Science, Technology and Innovation
- **YB. Dato' Seri Mohamed Khaled Nordin**, Minister of Higher Education
- **YB. Dato' Sri Anifah Hj Aman**, Minister of Foreign Affairs, Malaysia
- **H.E. Dato' Sri Jamaludin Jarjis**, Ambassador of Malaysia to the United States
- **YBhg. Tan Sri Dr. Ahmad Tajuddin Ali**, President, Academy of Sciences of Malaysia
- **YBhg. Tan Sri Dato' Azman Hj. Mokhtar**, Managing Director, Khazanah Nasional
- **YBhg. Dato' Shamsul Azhar Abbas**, President and Chief Executive Officer, Petronas
- **YBhg. Dato' Mohd Bakke Salleh**, President and Group Chief Executive, Sime Darby
- **YBhg. Dato' Sabri Ahmad**, Group Managing Director, Felda Holdings Bhd.

EX-OFFICIO MEMBERS

- **YBhg. Dato' Madinah Mohamad**, Secretary General, Ministry of Science, Technology & Innovation
- **YBhg. Datuk Loo Took Gee**, Secretary General, Ministry of Energy, Green Technology & Water
- **YBhg. Datuk Ab. Rahim Md. Noor**, Secretary General, Minister of Higher Education
- **YBrs. Mr. Mohd Yusoff Sulaiman**, President and Chief Executive Officer, Malaysian Industry-Government Group for High Technology (MIGHT)
- **YBhg. Datuk Badlisham Ghazali**, Chief Executive Officer, Multimedia Development Corporation (MDEC)
- **YBhg. Dato' Iskandar Mizal Mahmood**, Chief Executive Officer, Malaysian Biotechnology Corporation
- **YBhg. Dato' Dr. Kamal Jit Singh**, Chief Executive Officer, Malaysia Innovation Agency
- **YBhg. Dato' Ir. Lee Yee Cheong**, Chairman, Governing Board of the International Science, Technology and Innovation Centre (ISTIC), for South-South Cooperation under the Auspices of UNESCO.





GSIAAC COUNCIL MEMBERS

GLOBAL SCIENCE & INNOVATION ADVISORY COUNCIL (GSIAAC) INAUGURAL MEETING

THE NEW YORK ACADEMY OF SCIENCES, NEW YORK, UNITED STATES OF AMERICA



MAY 17, 2011

From left to right

FRONT ROW - Tan Sri Dr Ahmad Tajuddin Ali, Hon. Datuk Seri Dr Maximus Johnlity Ongkili, Hon. Dato' Seri Peter Chin Fah Kui, Mr Ellis Rubinstein, Hon. Dato' Sri Najib Tun Abdul Razak, Prof Emeritus Dato' Dr Zakri Abdul Hamid, Hon. Dato' Seri Mohamed Khaled Nordin, H.E Dato' Sri Dr Jamaludin Jarjis, Mr Mohd Yusoff Sulaiman.

MIDDLE ROW - Dr Vivek Wadhwa, Dr Annalee Saxenian, Dr Karin Pavese, Dr Wan Abdul Rahaman Wan Yacob, Dr Roger Wyse, Dato' Ir Lee Yee Cheong, Dr Paul Horn, Dr Torsten Wiesel.

REAR ROW - Tan Sri Dato' Azman Mokhtar, Hon. Jerry MacArthur Hultin, Mr Brian Mefford, Dr Aalt Dijkhuizen, Dato' Mohd Bakke Salleh, Dr Anthony J Sinskey, Dato' Sabri Ahmad, Dato' Shamsul Azhar Abbas, Datuk Badlisham Ghazali, Hon. Ilya Ponomarev.

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Cloud Computing for SMEs in Malaysia

A Public Private Partnership:

Unlocking the potential of Cloud Computing for a New World of Business



BY

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Microsoft Asia Pacific
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DR. DZAHARUDIN MANSOR

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THE CLOUD AND SMES: FUELLING THE ENGINES FOR SUSTAINABLE GROWTH

Even as uncertainty looms over the global economy, Asia Pacific remains poised for continued economic growth. Key to this has been the performance and positioning of small and medium-sized enterprises (SMEs) that represent over 95% of businesses in most APEC economies and often generate well over half of all employment and anywhere from 30-60% of GDP.

In Malaysia, SMEs are estimated to comprise 99% of total businesses and provide 56% employment, ultimately contributing to 31% of GDP and 19% of exports. Interestingly, the SME segment outpaced GDP from 2004 to 2009, and was relatively resilient to economic down turns. These facts have been recognised in the 10th Malaysia Plan (2011-2015) where there is strong emphasis on developing the small business ecosystem. In fact SMEs are seen as an important driver for the economy, and Malaysia targets to boost growth from an average of 6.3% to about 8.0%. However, to unleash the untapped potential of SMEs in Malaysia, there is a need to transform these entities to be more competitive and resilient to the changing business environment.

Information Communications Technology (ICT) is often seen as a tool to enable such transformation. In

the past, the cost of implementing and maintaining the required ICT solutions to effectively support the business needs of a progressive SME companies has been a major obstacle. Cloud computing is seen as a potential solution to this problem, and this turning point in the ICT industry could not have happened at a better time for Malaysia.

Untapped Potential

However impressive the numbers, the vast majority of SMEs are undercapitalized, underdeveloped and underserved when it comes to the technology tools and human expertise needed to run their businesses. Most technology vendors tend to forget that technology tools are just that – tools. Most SMEs do not have IT departments with specialists who know how to operate these tools. And anything that takes them away from their core focus is costing them revenue. With cloud computing the game has changed, offering SMEs the opportunity to leverage enterprise-level applications and development platforms without the associated upfront capital expenditure or complex IT roll-out. Cloud-based CRM, resource management and HR applications drive greater efficiency in basic company functions at prices that are infinitely more manageable to SMEs with tighter finances and cash flows, can often be turned on and off as they are required, and are increasingly intuitive to use and integrate into business needs. Applications hosted in the cloud

can help to ensure business continuity and prevent massive data loss in the event of disasters, a lesson we have been reminded of several times in recent months. The utility-based model of cloud computing is another boon for SMEs, not only for cost control, but because it allows them to work with services on a smaller scale first before ramping up into full deployment, significantly lowering the barrier to entry for cloud services.

Closing the Gap

While the potential for cloud computing is evident, recent research commissioned by Microsoft shows that there is some way to go to ensure that the cloud is being leveraged by SMEs in the region. The Microsoft sponsored Springboard Survey reveals that while larger Asian businesses are embracing cloud services, SMEs are lagging behind their enterprise cousins with 62% of organisations of more than 500 PCs either having adopted or planning to adopt cloud, while 68% of organisations with less than 50 PCs having no plans to adopt cloud computing. While some Asian cultures including Malaysia can be naturally cautious, this is a missed opportunity that could impact competitiveness for the country. Surprisingly though, the research also highlights the key driver of, and barrier to, cloud adoption is not simply managing cost, with most citing the ability to support unpredictable workloads as the most important consideration in adopting the cloud. In

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terms of concerns, data security and how to guard against unauthorised access are the biggest barriers. Clearly, regardless of size and geography, the need to address trust and confidence is as important as reliability and cost.

A PARTNERSHIP FOR DEVELOPMENT

The Role for Government

Besides being an important user of cloud services, governments also have a major role to play in encouraging and enabling the adoption of cloud by SMEs, including;

1. The provision of affordable high quality broadband availability;
2. The right policy framework to promote trustworthy and secure cloud services for SMEs such as updated laws and regulations on data protection, privacy and cybercrime;
3. Ensuring that new laws and regulations don't impose unintended restrictions on the flow of information from SME customers to cloud service providers;
4. The promotion to adopt cloud computing and broadband to increase productivity and market reach such as the collaboration between SME Corp., Suruhanjaya Syarikat Malaysia and Microsoft.
5. Government initiatives that foster the ecosystem for the development of cloud applications on top of IaaS and PaaS services, which not only encourage local software start-ups, but also the development of cloud applications customised for the local market such as the initiatives led by Multimedia Development Corporation (MDeC).
6. Providing the necessary skills to SME owners and employees in the safe and effective use of these technologies as part of governments' broader training and education policies for the SME sector; and
7. A review and overhaul of often inconsistent legacy regulations that have the potential to impede the deployment of cloud services in various markets, such as carrier licenses, interception laws and other regulatory conditions that constrain the ability for global services to be launched in certain markets.

The Role for Industry

The community should have a greater expectation on the technology sector than simply providing the platform and services for the cloud; indeed, the industry must take an even more enhanced role in providing responsible stewardship for the cloud in areas such as:

1. Providing a trustworthy online experience that respects the privacy of users, secures and protects information from misuse and maintains its infrastructure and services with the highest standards of security and reliability;
2. Supports greater interoperability of data and applications in the cloud, including working on industry standards to promote data portability and choice for customers;
3. Fosters local innovation and expertise through the development of new services and applications that leverage the scale and potential of the cloud; and
4. Partner with policy makers and thought leaders on helping shape the legal and regulatory frameworks to develop good cloud governance models as well as advance the development agenda for national economies

The Role for Microsoft

Microsoft has a long heritage in Malaysia of investing in programs and projects that help transform the provision of public sector services such as education, healthcare and public safety, fostering local innovation and software ecosystems and enabling opportunities for individuals and business to reach their potential. The cloud provides additional momentum for these programs to achieve new possibilities such as:

1. Deploying an increasing array of enterprise-class cloud services in Malaysia on both a no-charge such as Windows Live Hotmail, MSN Messenger, SkyDrive and subscription basis services through such as Microsoft Office 365 and Windows Azure;
2. Investing in the technology ecosystem and encouraging local innovators to use our Windows Azure platform to develop and deploy applications and services for global reach. Examples of this is a program called "BizSpark" and "DreamSpark" where we provide start-up companies and individuals respectively with most of our software for developing software solutions at no cost. In

collaboration with MDeC and MIMOS, we have also established Microsoft Innovation Centers (MIC) with the goal of helping start up software companies to be successful. So far we have had about 150 companies going through the MIC program

3. Helping improve the efficiency and reach of citizen services by improving learning outcomes for students and teachers through technology access and training and connecting the educational institutions through the cloud; An example of this is Microsoft's Partners in Learning (PiL) program where we have trained over 3,670,000 teachers and students in Malaysia on how to leverage on technology for teaching since 2004.
4. Providing citizens with greater access to e-government services and information via our connected government framework programs and helping protect and keep safe the community by supporting the effective sharing of information amongst law enforcement and public safety. Microsoft works closely with government organizations like Cyber Security Malaysia and IMPACT in a number of security related programs as part of collaboration with the government agencies;
5. Enabling jobs and opportunities through expanding the community's access to technology and training and empowering non-government organisations (NGOs) with the software and computing resources they need to better serve their beneficiaries. Through our NGO partners, approximately 30,000 people from the underserved community have benefited and trained under the Unlimited Potential – Community Technology Skills Program. Since 2004, Microsoft Malaysia has donated approximately USD 1,008,431 worth of software to various NGOs.

CONCLUSION

The future growth of Malaysia will depend on the development and fostering of a human capital and knowledge economy especially in the SME sector. The arrival of cloud computing is a real opportunity for Malaysia to further extend IT adoption to the SME sector and maximise their contribution to the national economy. Furthermore, the cloud will not only make existing SMEs more efficient and competitive, but spur the incubation of new businesses and new business models and open up the region to greater trade in digital goods and services.

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The National Science and Research Council



BY
DR. VILASINI PILLAI



The Council will also solicit inputs from various experts locally and internationally that will be brought together under the NSRC to formulate and develop short-, mid- and long-term S&T transformation plan, initiative and programs for the country

INTRODUCTION

Malaysia's rapid growth in Science and Technology (S&T) since independence has transformed vital sectors including Industry, Government and Society, guided by policies such as the New Economic Policy (NEP 1971-1990), National Development Policy (NDP 1991-2000) and the National Vision Policy (NVP 2001-2010). It has successfully transformed from a low-income economy to a middle income and is facing its toughest challenge to move into a high income economy, which involves becoming technology generating instead of technology importing where innovation is the key.

S&T cuts across various sectors of commercial and social activities which come under the purview of different ministries. Therefore the role of S&T in the economy has to be enhanced and strategised through a coordinated, cohesive and inclusive S&T advisory system. The advisory mechanism must have legitimacy, authority, capacity and linkages to deliver objective, neutral and timely advice. The National Science and Research Council (NSRC)

was proposed under the RMK-10 to improve the governance of R&D as there was an urgent need to have a collective alignment of S&T priorities through an effective network of all government research institutes and facilities as well as energise a dynamic link with all S&T related entities. This is to ensure that a real time monitoring of the impact of sectoral R & D funding can take place for maximising R & D productivity in the effective implementation of the government's plan for a high income economy.

The setting up of the NSRC was approved by Cabinet on the 10th of December 2010 to replace the dormant National Council of Science, Research and Development (NCSRD). The NSRC has been mandated to ensure that the country's investments in science and technology are making the greatest possible contribution to a high- value economy through an increase in productivity, environmental quality, stimulation in R&D and enhancement of the skills of the Malaysian workforce.

The NSRC is the focal point to channel S&T inputs from various governmental organizations,

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industries, academicians and non-governmental organizations including business and social associations to be consolidated as strategic S&T inputs that are neutral, non-bias and non-ministerial to the Prime Minister and the Government of Malaysia. The Council will also solicit inputs from various experts locally and internationally that will be brought together under the NSRC to formulate and develop short-, mid- and long-term S&T transformation plan, initiative and programs for the country to drive Malaysia transformation into Knowledge – and Innovation-led economy. These strategic plans will also provide bold and practical recommendations so that it can be part of the backbone of the New Economic Model, be integrated into the 10th Malaysian Plan and delivered through the 11th Malaysian Plan.

Its unique position will allow it a platform to provide long range scientific advice on issues of national importance, highlighting areas of research that will provide the greatest benefit to the Rakyat taking into account the multi-disciplinary and cross cutting nature of the various Ministries involved in R&D. This council will align and synchronize S&T focus to consolidate the research efforts in a manner that will minimize duplication, overlap and redundancy; to drive convergence; and monitor and evaluate the country's knowledge, technology and innovation and product portfolios. A review of a quality and evaluation system to assess S&T projects will be initiated by the Council to enhance research outcomes. The Council is also mandated to provide accurate, relevant, and timely scientific and technical advice and also ensure that government policies are informed by sound science to the stakeholders.

OPERATIONAL STRUCTURE

The NSRC operates in an inclusive, autonomous, transparent and consultative manner. The members of the council are appointed by the Rt. Hon. Prime Minister for a term of 2 years and renewable once.

Currently, there are 25 council members appointed for the term 2011-2012 and they are from Ministries, Government Agencies, Universities, Industry and the Academy of Sciences. The Chair of the NSRC is Prof. Emeritus Dato' Dr. Zakri Abdul Hamid, Science Advisor to the Rt. Hon. Prime Minister.

The NSRC is supported by a Secretariat in the Ministry of Science, Technology and Innovation (MOSTI). The Secretariat under the NSRC is

a dedicated entity in MOSTI, assisting in the implementation and execution of the council's strategic plans and programmes across the relevant Ministries/Agencies.

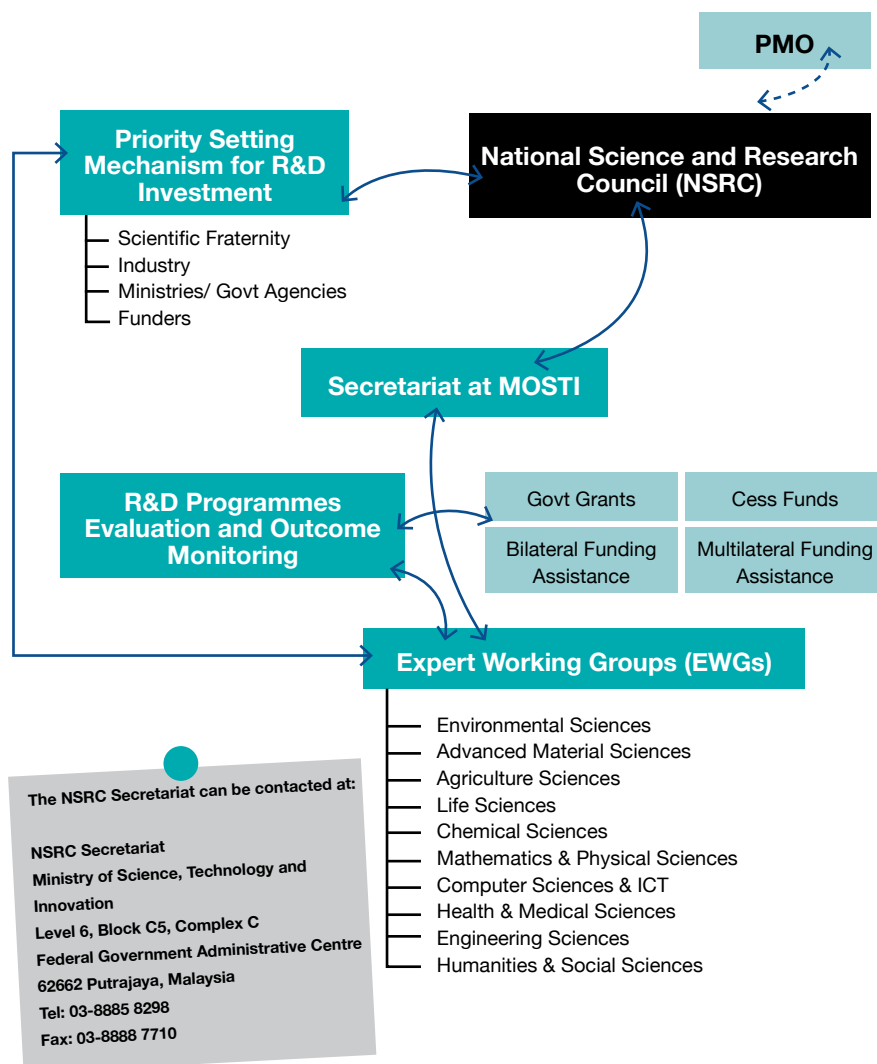
THE EXPERT WORKING GROUPS

Under the NSRC, 10 Expert Working Groups (EWG) have been identified in various science based focus areas. The EWGs, according to their respective scope, will be tasked to develop R&D Roadmaps and Strategies with the assistance and consultation of various stakeholders. These then will be used by the Council to set National R&D Priorities as well as initiate Top-Down Challenges

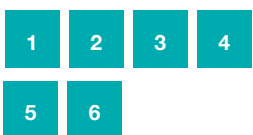
to address issues identified. The EWGs will also be called upon to conduct strategic evaluation of projects sent in by respective funding Ministries and for final feedback to the Council through the Secretariat. The EWGs set up are as follows:

- Environmental Sciences
- Advanced Material Sciences
- Agriculture Sciences
- Life Sciences
- Chemical Sciences
- Mathematics & Physical Sciences
- Computer Sciences & ICT
- Health & Medical Sciences
- Engineering Sciences
- Humanities & Social Sciences

Figure 1 Operational Structure and Framework



NSRC Council Members



1. PROF. EMERITUS DATO' DR. ZAKRI ABDUL HAMID

(Chairman)

Science Advisor to the Prime Minister

2. TAN SRI DATUK DR. HJ OMAR ABDUL RAHMAN

Academy of Sciences Malaysia

3. PROF. EMERITUS TAN SRI DATUK DR. AUGUSTINE ONG SOON HOCK

Academy of Sciences Malaysia

4. DATO' IR LEE YEE CHEONG

Academy of Sciences Malaysia

5. YM TENGKU DATUK DR. MOHD AZZMAN SHARIFFADEEN TENGKU IBRAHIM

Director, Pernec Corporation Berhad

6. BRIG. JEN. PROF. DATUK SERI PANGLIMA DR. KAMARUZAMAN HJ AMPON

Vice-Chancellor, Universiti Malaysia Sabah

7. PROF. DATO' DR. KHALID YUSOFF

Professor, Medicine and
Senior Consultant Cardiologist,
Dean, Faculty of Medicine, Universiti Teknologi Mara



8. PROF. DATO' DR. MUHAMAD RASAT MUHAMAD

President, Multimedia University

9. DATUK IR (DR.) ABDUL RAHIM HASHIM

President, Malaysian Gas Association,
President, International Gas Union

10. PROF. DR. JALANI SUKAIMI

Dean, Faculty of Science and Technology,
Universiti Sains Islam Malaysia



11. PROF. DATIN DR. AZIZAN BAHARUDDIN

Director, Centre for Civilisational Dialogue,
University of Malaya

12. DATO' AMDAN MAT DIN

Ranhill Bhd.





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13. PROF. DR. RAJAH RASIAH

Professor, Department of Development Studies,
Faculty of Economics and Administration,
University of Malaya

14. PROF. DR. JANE CARDOSA

Chief Scientific Officer,
Sentinext Therapeutics Sdn. Bhd.

15. PROF. DR. HALIMATON HAMDAN

Head, National Nanotechnology Directorate,
Ministry of Science, Technology and Innovation

16. PROF. DR. JAYUM ANAK JAWAN

Deputy Dean (Postgraduate Studies),
Faculty of Human Ecology,
Universiti Putra Malaysia

17. DR. DAVID LACEY

Director, Osram Opto Semiconductors (M)
Sdn. Bhd.

NSRC Secretariat



1

2

3

1. DR. VILASINI PILLAI

Head of Secretariat

2. AMUTHAM SUBRAMANIAM**3. ABBIL AJES MOHAMMAD HANIEFF**

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Can We Ignore Nuclear?



BY
MUHAMMAD HASIF
HASAN



Several studies
show that nuclear
energy is
cost-effective

Energy is indispensable. Not many will dispute that. Without adequate energy, the entire world will be paralysed. This is why energy is a priority.

There are many energy concerns though. Adequate supply to meet the growing global demand is one. In fact, energy has been at the centre of many conflicts; most are about the struggle to assume control over key energy sources, especially fossil hotspots around the world. For decades, the world has been over dependent on fossil energy for fuel. These are mainly crude petroleum, coal and natural gas. But fossil fuels have also been blamed for global warming, a phenomenon which poses threat to the well-being of the planet. The search for less harmful alternatives has been going on for years. A number of options have emerged. Both solar and wind have received a lot of attention. But solar is still expensive; whilst wind is limited to strong wind areas. Increasingly, nuclear power has come under the spotlight.

The revival in the global interest in nuclear power within the past several years has been attributed in no small measure to the growing concern over the future supply of fossil. The almost explosive demand by India and China is one factor fuelling such worry. Nuclear is also attractive because of the global warming issue. Nuclear power offers much reduced carbon emission. However, those in the climate change committee have yet to include nuclear as a mitigation measure. But nuclear does have its share of the negatives. Top of the list is the issue of safety, particularly those concerning the disposal of the reactor's radioactive wastes. The other has to do with the potential abuse to produce nuclear weapons. But proponents of nuclear power say all such negatives are not unmanageable. In fact the claim is that, thanks to improved design over the years, the new generation of reactors have much reduced safety risks.

It has become evident that a major topic of concern in global energy is the security of supply, as countries experience interrupted deliveries of oil and gas. The abundance of naturally occurring uranium makes

nuclear power attractive. Increasing fossil fuel prices have also greatly improved the economics of nuclear power. Several studies show that nuclear energy is the most cost-effective of the available technologies. In addition, as carbon emission reductions are encouraged through various forms of government incentives and trading schemes, the economic benefits of nuclear power will increase further. A longer-term advantage of uranium over fossil fuels is the low impact that increased fuel prices will have on the final electricity production costs, since a large proportion of those costs are in the capital cost of the plant. This insensitivity to fuel price fluctuations offers a way to stabilize power prices in deregulated markets. As the nuclear industry is moving away from small national programmes towards global cooperative schemes, serial production of new

trends & issues



Should Malaysia go nuclear? While it is true that there are still lingering doubts among consumers on the safety of nuclear, such concerns are not as big as they used to be.

plants will drive construction costs down and further increase the competitiveness of nuclear energy.

In fact, nuclear energy is a well-established component of electricity supply in many OECD countries. There are now 439 nuclear reactors in operation around the world in over 30 countries, providing almost 16% of the world's electricity. The first commercial reactors came into operation during the late 1950s, but the industry really "took off" in the 1970s, when concern over energy security and fossil fuel prices prompted many governments and power companies to consider nuclear plants. Over 200 reactors came into operation during the 1980s, but by the end of the decade, there had already been a marked slowdown of orders prompted by a range of economic and public acceptance issues.

Currently, nearly one quarter of the electricity consumed in OECD countries is generated by some 350 nuclear units in operation in 16 member countries. For several of those countries, the contribution of nuclear energy to security of supply

is important, and in some cases essential, in the light of their lack of domestic fossil fuel resources and limited potential for harnessing efficiently renewable energy sources. Over 60 further nuclear power reactors are under construction, equivalent to 17% of existing capacity, while over 150 are firmly planned, and equivalent to 46% of present capacity.

However, the implementation of nuclear projects often raises social concerns about risks associated with possible releases of radioactivity in routine and accidental situations, radioactive waste disposal and nuclear weapons proliferation. The natural disaster that struck Japan recently has raised several questions on the reliability of the plant to withstand such damaging shocks. But we should also be reminded that the Fukushima reactor design has not been upgraded to the latest in the market. Now there are available new generation reactors which offer much better safety guarantee. The superb safety record achieved by the current generation of reactors has led to increased confidence among the public. Such confidence in fact forms the basis

of the renewed interest in nuclear. Many initiatives were taken in the aftermath of the Three Mile Island and Chernobyl to incorporate a strong safety culture throughout the world nuclear industry.

So, should Malaysia go nuclear? While it is true that there are still lingering doubts among consumers on the safety of nuclear, such concerns are not as big as they used to be. Furthermore, with the new developments in reactor design, the safety standards of nuclear power plants continue to witness improvement. At the same time, nuclear scientists are exploring other reaction mechanisms in the interest of improving safety, reliability and cost. For example, the fusion rather than the fission reactions, has been claimed to produce less waste. Experiments on such options have already reached a pilot stage. Obviously, R&D on nuclear should go on. This is because, whatever the risks, the technology does offer many benefits for mankind. It would be retrogressive for the world if we do not continue to rise to the challenge of this technology for energy generation.

viewpoints



Foresight on Construction Technology

Manufactured Housing/ Industrialised Building System (IBS)



BY
ABDUL RAHMAN HAMDAN

The economy will play a critical factor for a technology such as IBS because prosperous economy will eventually create more housing projects. Population increase will also spur development of the technology. Any events that affect the economy and population of the country will have the highest impact to the technology.

OVERVIEW

In this article, the scenario planning tool, one of the many foresight techniques will be used to analyse the potential of manufactured housing to be the mainstream technology for Malaysia in the future. The manufactured housing or commonly known as the Industrialised Building System (IBS) has been making waves in the Malaysian Construction Industry so far due to the Government's commitment in reducing the foreign labour and, at the same time innovating the construction processes.

By definition, IBS or referred to in some countries as prefabricated construction, is a methodology whereby components are produced in a controlled environment (either in factories or on-site), and transported and assembled at project sites.

However, it is important for any company to be involved in this industry to include the foresight analysis in determining the possibility of growth for this technology. Therefore a scenario planning tool is critical in assessing the potential business that can be derived. The tool can be used to predict the future of this technology and whether it can still be relevant up until 2025. Scenario planning tool can be used to generate several possible future scenarios of the construction & housing industry and therefore preparing the company in any possible outcomes of the future.

EXPECTATIONS FROM SCENARIO PLANNING

This scenario planning time frame covers until the year 2025 with multiple scenarios will be created based on several possible outcomes. The outcomes will be chronology of events that will lead up to the status of the industry in 2025.

One of the environments driving force that will influence the scenario planning will be the economy. The economy will play a critical factor for a technology such as IBS because prosperous economy will eventually create more housing projects. Population increase will also spur development of the technology. Any events that affect the economy and population of the country will have the highest impact to the technology. The company will also be affected by any events that increase the cost of construction materials such as cements and steels.

As can be seen in the trends of manufacturing in other industries, the method of production is no longer in mass production but is now gearing towards mass customisation. The customer's demands are now more demanding than ever and they want quality in the products that they purchased. Therefore, the construction industry has no option but to abide to this growing trend. If a disruptive technology emerges in the construction industry that can replace IBS, it is predicted that the technology must also be in the line of mass customization and faster delivery.

viewpoints

DESCRIPTION OF THE WORK METHOD

The scenario planning tool will be shown step by step as the stories for the multiple scenarios is being developed through the four steps. The four steps of the scenario planning tool consist of:

- Step 1 – Setting the Scene**
- Step 2 – Understand the Driving Force**
- Step 3 – Plot Scenarios**
- Step 4 – Strategy, rehearsal and convention**

Based on the multiple scenarios created, strategies will be developed to prepare the company for the predicted future.

WORK METHOD

Step 1: Setting the Scene

The vision and mission of this exercise is to predict the status of Malaysia's construction & housing industry and the relevancy of IBS or manufactured housing. The tool is also being used to predict for any disruptive technology that can replace IBS. The time frame will cover up until the year 2025 and will be based on several environment driving forces such as political, economic, social, technological, ecology, legal and structure.

Step 2: Understand the Driving Force

In this exercise, ideas are thrown and listed without any particular order. The listings of ideas are as shown in **Table 1**.

Clustering the ideas

The ideas generated can then be clustered into the environment driving forces as shown in **Table 2**.

Table 1 Ideas of Possible Futures and Scenarios

1	Population increases dramatically. Malaysia's population reaches 50 million.
2	World War 3 erupted. Many houses being destroyed. Shortage of houses.
3	Big Earthquake in Malaysia. Needs of houses to be built quickly to replace damage houses
4	Change in consumer behaviour. People change houses as similar as people change cars today. New models of houses come up every year. Changes of lifestyles whereby people change doors and windows very frequent as similar as they change curtains and furniture during festive occasions.
5	Foreign labours big riot. – Government stops taking labours from foreign countries – Construction industry collapse and housing projects halted
6	Indonesia economy collapse. – Many unemployed workers. Government of Malaysia decides to help and let back the Indonesia foreign workers to work in Malaysia. This causes influx of foreign labours and the construction industry falls back to use traditional method since it is cheaper than using IBS.
7	Population drop. – Widespread infertility and falling birthrates. Decreases home buyers. Housing industry falls.
8	Economic crisis. – Inflation reaches 200%. People do not have the money to buy houses anymore. People buying houses drastically reduce and therefore no more housing projects.
9	Disruptive Technology. – People no longer live in houses but in capsules. This capsule is provided by the Government free of charge and portable.
10	Big Flood. – Sunken entire coast of Malaysia. Houses are now being built underwater.
11	Indonesia becomes an economic power house. – All Indonesian foreign workers move back to their country since employment is abundant there. Malaysia has shortage of foreign workers.
12	Prices of construction materials such as cement and steel goes 200% up. – The price of house and building escalates. Houses use glass or woods as materials.
13	Government's Policy. – Buildings are now mandatory required to be energy efficient.

viewpoints



It is important for any company to be involved in this industry to include the foresight analysis in determining the possibility of growth for this technology. Therefore a scenario planning tool is critical in assessing the potential business that can be derived.

14

Regulatory Changes.

- Government promotes one standard system of manufactured houses to be followed by the industry.

15

Globalisation.

- Big companies that have established technology in home manufacturing such as Japan enters Malaysian markets. Offer less expensive and better quality houses.

16

Change of Ruling party.

- The opposition wins the general election and becoming the ruling party.

17

Malaysia has a radical leadership.

- The country starts to build nuclear weapons. Economic sanction imposed by the United Nations.

18

Malaysia's relations to neighbouring countries worsened.

- Indonesia, Singapore, Thailand cuts diplomatic ties with Malaysia

19

Global warming drastically increase.

- International regulations have been imposed. Malaysia can no longer cut its trees to developed lands. Houses and building projects become stagnant.

20

Oil reserve of the world depleted.

- The new renewable energy is biofuel. Lands in Malaysia are now being used to grow Palm Oil. Available lands for housing decreases. Building and Housing remains stagnant.

21

Strange diseases struck and spread throughout Malaysia.

- More hospitals are needed.

22

A strange disease struck and no cure can be found.

- Population of Malaysia reduces drastically.

23

Malaysia enters a biotechnology boom as global demands growing stronger.

- Malaysia's education is revamped to cater to these demands. Ninety percent of Malaysian workforce will graduate and work in the Biotechnology sectors. Construction industries are left with no knowledge workers and therefore have to start taking back foreign workers.

24

Nuclear War erupted causes the environment to change.

- People now start to live underground due to the harsh environment outside such as acid rain and thunderstorm.

25

Military Coup.

- Malaysia is a military government. All houses and building are to be built only by government appointed agencies with military requirements.

viewpoints

Table 2 Environment Driving Forces

Areas	Cause	Effect
Political	Change of Ruling party	The opposition wins the general election.
	Government's Policy	Buildings are now required mandatory to be energy efficient.
	Malaysia has a radical leadership	The country starts to build nuclear weapons. Economic sanction imposed by UN.
	Military Coup.	Malaysia is a military government. All houses and building are to be built only by government appointed agencies with military requirements.
Economic	Economic crisis	Inflation reaches 200% - People do not have the money to buy houses anymore. People buying houses drastically reduce and therefore no more housing projects.
	Indonesia economy collapse	Many unemployed workers. Malaysia Government decides to help and let back the Indonesia foreign workers to work in Malaysia. Influx of foreign labours. This causes the construction industry to fall back to use traditional method since it is cheaper than using IBS.
	World War 3 erupted	Many houses being destroyed. Shortage of houses.
	Indonesia becomes an economic power house.	All Indonesian foreign workers move back to their country since employment is abundant there. Malaysia has shortage of foreign workers.
	Prices of construction materials such as cement and steel goes 200% up	The price of house and building escalates. Houses use glass or woods as materials.
	Globalisation	Big companies that have established technology in home manufacturing such as Japan enters Malaysian markets. Offer less expensive and better quality houses.
Social	Population increases dramatically	Malaysia's population reaches 50 million.
	Foreign labours big riot	Government stops taking labours from foreign countries. Construction industry collapsed. All projects halted.
	Change in consumer behaviour	People change houses as similar as people change cars today. New models of house come up every year. Changes of lifestyles, people change doors and windows very frequent as similar they change curtains and furniture during festive occasions.
	Population drop	Widespread infertility and falling birthrates. Decreases home buyers. Housing industry falls.
Technological	Disruptive Technology	People no longer live in houses but in capsules. This capsule is provided by the Government free of charge and portable.
	Malaysia enters a biotechnology boom as global demands growing stronger	Malaysia's education is revamped to cater to these demands. Ninety percent of Malaysian workforce will graduate and work in the Biotechnology sectors. Construction industries are left with no knowledge workers and therefore have to start taking back foreign workers.
Ecology	Big Earthquake in Malaysia	Needs of houses quickly to replace damage houses.
	Big Flood	Sunken entire coast of Malaysia. Houses are now being built underwater.
	Global warming drastically increase	International regulations have been imposed. Malaysia can no longer cut its trees to developed lands. Houses and building projects become stagnant.
	Oil reserve of the world depleted	The new renewable energy is biofuel. Lands in Malaysia are now being used to grow Palm Oil. Lands for housing decreases. Building and Housing remains stagnant.
	Strange diseases struck and spread throughout Malaysia	More hospitals are needed.
	A strange disease struck and no cure can be found	Population of Malaysia reduces drastically.
	Nuclear War erupted causes the environment to change	People now start to live underground due to the harsh environment outside such as acid rain and thunderstorm.
Legal	Regulatory Changes	Malaysia's population reaches 50 million.
Structure	Malaysia's relations to neighbouring countries worsened	Indonesia, Singapore, Thailand cuts diplomatic ties with Malaysia.

viewpoints

Figure 1 Impact to Organization versus Uncertainty Matrix

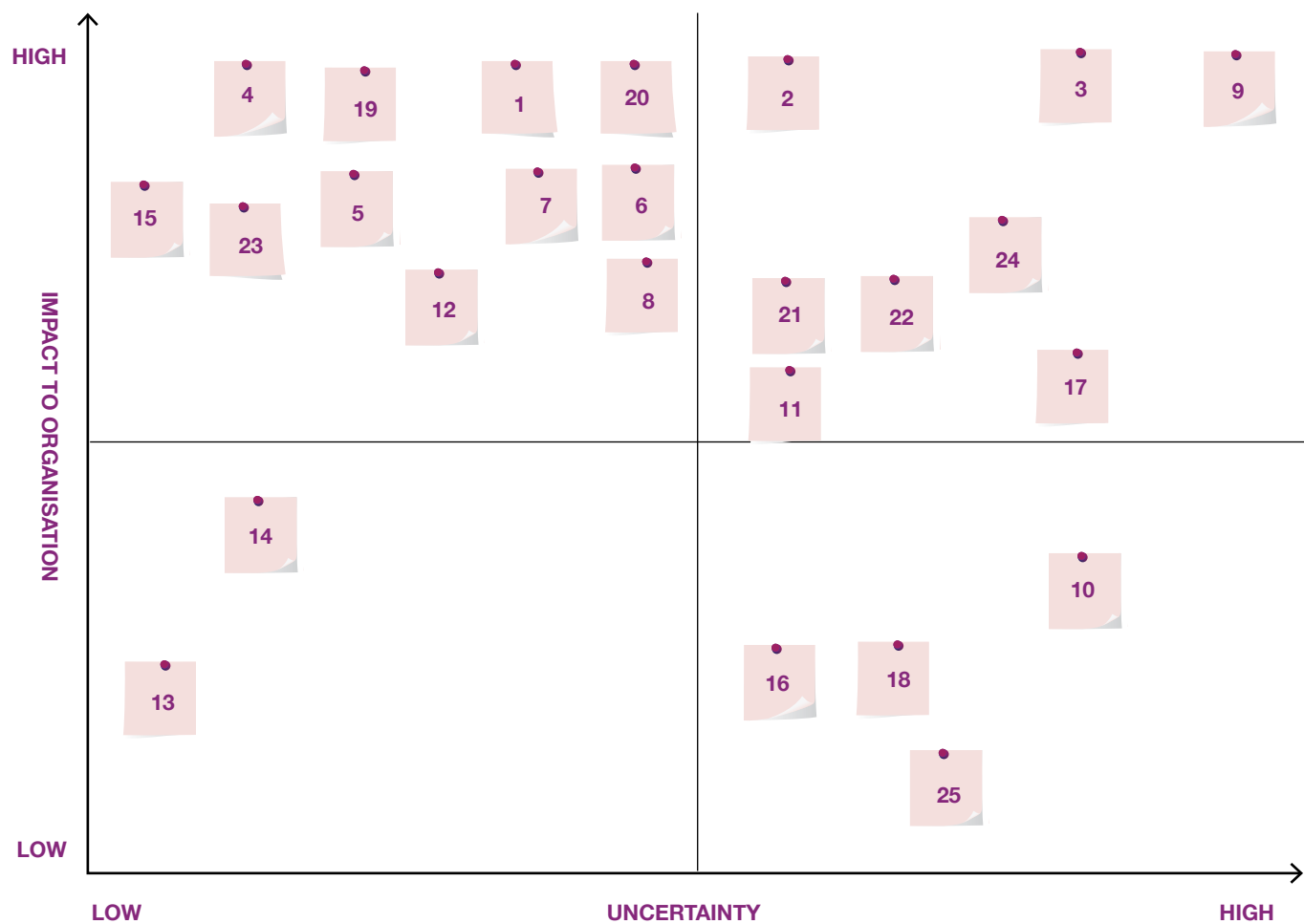
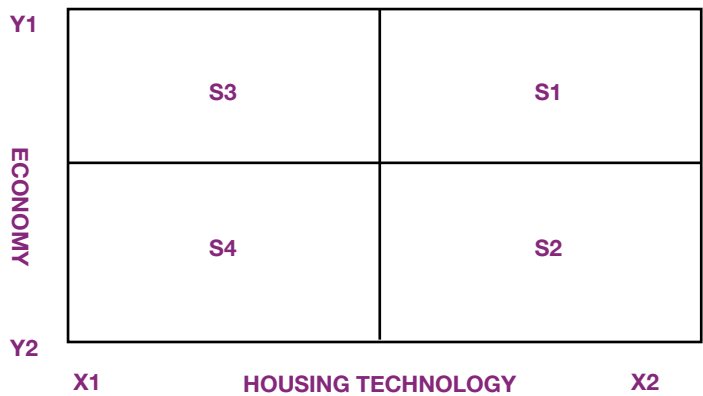


Figure 2 Economy versus Housing Technology Matrix



Step 3:
Plot Scenarios

The lists of ideas are then plotted in a matrix of ‘**impact to organization versus uncertainty**’ as shown in Figure 1.

Based on the highest impact and highest uncertainty in the previous matrix, a matrix of ‘**Economy versus Housing Technology**’ is then created to produce the multiple scenarios as shown in Figure 2.

From the matrix of ‘**Economy versus Housing Technology**’, multiple scenarios were created. Based on the storyline, the scenarios are named **Renaissance, Reformation, Retribution and Revolution**.

viewpoints

The earlier perception before the scenario planning was that any disruption to the economy of the country will automatically disrupt the construction industry. The findings from the 'Reformation' scenario shows that even with unstable government and economic disruption, IBS can still flourish.



Renaissance Scenario

2012 – Malaysia starts to invest in Biotechnology and focuses on Malaysia's unique Biodiversity as a niche. Education in schools and college are revamped to produce skill workers in Biotechnology. Construction industry receives a boost as the demand for infrastructure on Biotechnology increases.

2015 – Malaysia starts to feel the heat of globalization as companies that have established technology in manufacturing houses starts to enter Malaysia in a big way. Japanese companies are now offering better and cheaper manufactured houses. Other sectors are also suffering the same fate. This increases the need for Malaysia to specialize on niche areas such as biotechnology.

2020 – Malaysia enters a new era as biotechnology starts to generate wealth for the country. The construction industry suffers the lack of knowledge workers due to the preference of graduates to go into the more prestige biotechnology industry.

2025 – Malaysia becomes a developed country. The salary workers in all industries increase 200%. Construction industries are finding alternatives to reduce the cost of construction projects. Industries are now starting to implement technology in construction.

Reformation Scenario

2012 – The Government calls for a general election. At the end of the election process, the opposition has won the majority seats and therefore making them the ruling party.

2015 – The new Prime Minister of Malaysia appointed is a very radical and aggressive person.

He starts to modernize the military and announces to the world that Malaysia is now making nuclear weapon for defensive purposes. This causes uproar by the international arena. Prices for materials such as cement and steel starts to escalate.

2020 – Malaysia announces that it now have nuclear weapon. The United Nations decided to impose economic sanction on Malaysia. Material cost such as cement and steel went up 200%. Many construction projects are abandoned due to the rapid increase of material cost. Indonesia and other countries stop sending their workers to Malaysia due to the economic sanction therefore creating shortage of workers.

2025 – Industrialised Building System gained rapid acceptance due to the high price of concrete and shortage of workers. Houses in Malaysia now use timber panel and glass panel for construction. Fully automated factories are used to produce these components.

Retribution Scenario

2012 – A big earthquake and followed by a big flood devastated Malaysia. From the aftermath of the catastrophe, Malaysia needs houses quickly as many homeless people are in need of shelter. The company previously involved in IBS benefits from this as it can deliver 10,000 units of manufactured houses within 3 months. Government starts funding research on new technology in housing and how to quicken the delivery of houses.

2015 – Some of the developed nation and superpower countries decided to attack Iran and Syria for suspicion of having Weapons of Mass Destruction. This pre-emptive strike has caused

other countries to follow suit. Several countries started to form alliance and started the beginning of the Third World War. Pre-emptive strikes on several ASEAN countries including Malaysia have occurred.

2020 – World War 3 ended. Malaysia suffers heavy losses and damages in terms of buildings and houses. Thousands of people are left homeless. The Government is in critical need of houses and buildings. At the same time, an invention called 'Capsule House' has been invented. The capsule houses invention is very cheap and it is portable. The Government decides to give each Malaysian, one person one capsule and free of charge.

2025 – Companies that promote technology such as Industrialised Building System is no longer relevant as Capsule Houses are made in bulk volumes and subsidized by the Government.

Revolution Scenario

2012 – Indonesia the neighbouring country of Malaysia starts an economic reform. It aims to become a developed country by 2020.

2015 – Employment opportunities in Indonesia increase 200% and therefore creating an exodus of workers migrating from Malaysia to Indonesia. Malaysia suffers from critical depleting workforce. At the same time, Malaysia suffers from a strange disease that spreads and decreases Malaysia's population.

2020 – Indonesia becomes an economic power house. Indonesia's population increases drastically. Malaysia's economy started to collapse due to the shortage of skilled workers. The diseases are spreading rapidly throughout Malaysia.

viewpoints

2025 - The collapse of Malaysian economy and added by the chaos caused by the disease has made the government very unstable. This chaos is followed by a military coup. The Government is overthrown. Housing projects are totally controlled by the government with only appointed agencies can build buildings and houses.



Step 4: Strategy, Rehearsal & Convention

In step 4, scenario 3 and 4 are chosen due to the highest negative impact it can bring to a company that have IBS as their core business. Several strategies are then formulated to counter the predicted scenarios.

ANALYSIS OF RESULTS

Construction industry in Malaysia has always been a local industry. It is government driven and therefore any affect to the government will affect the construction industry. The scenario planning done earlier, took the account of severe economic disruption to the country. The earlier perception before the scenario planning was that any disruption to the economy of the country will automatically disrupt the construction industry. The findings from the 'Reformation' scenario shows that even with unstable government and economic disruption, IBS can still flourish.

Initial perception also suggests that as population increase, so will the need for housing. This will in turn profit the company. But the initial perception did not take into the account of very sudden and very high demands for housing for the entire country in a short period of time as shown in 'Retribution' scenario. In that scenario, the demand for houses is too high; the Government opted for a more advance technology that eventually replaces IBS.

Other initial perception includes the cost of materials for construction industry. It was assumed that any increase of cost for construction materials especially cement and steel will definitely have high impact to the construction industry. From the 'Reformation' scenario, it shows that the industry will eventually find alternative to replace this materials.

Scenario	Strategy
Retribution Scenario 2012 – A big earthquake and followed by a big flood devastated Malaysia. From the aftermath of the catastrophe, Malaysia needs houses quickly as many homeless people are in need of shelter. The company benefits from this as it can deliver 2,000 units of manufactured houses in within 3 months. Government starts funding research on new technology in housing and how to quicken the delivery of houses.	<p>The company's strategy at this point of time is to increase the capacity of delivering houses in thousands of unit. 20% of the profit margin gain will be used in research & development in improving the technology.</p> <p>The company is preparing to enter the Indonesian market as the volume for houses will grow if the aim of becoming a developed country is achieved by Indonesia.</p>
Revolution Scenario 2012 – Indonesia the neighbouring country of Malaysia starts an economic reform. It aims to become a developed country by 2020.	
Retribution Scenario 2015 – Some of the developed nations decided to attack Iran and Syria for suspicion of having Weapons of Mass Destruction. This pre-emptive strike has caused other countries to follow suit. Several countries started to form alliance and started the beginning of World War 3. A pre-emptive strike on several ASEAN countries including Malaysia has also occurred.	<p>The strategy of the company will be to start stockpiling construction materials such as cement and steels and wait until the war is over. At the idle stage, the company will start to increase the capacity of their manufacturing capability in anticipating the demand for houses.</p> <p>As the preparation has been done earlier, the company can start to enter Indonesia's market.</p>
Revolution Scenario 2015 – Employment opportunities in Indonesia increase 200% and therefore creating an exodus of workers migrating from Malaysia to Indonesia. Malaysia suffers from critical depleting workforce. At the same time, Malaysia suffers from a strange disease that spreads and decreases Malaysia's population.	
Retribution Scenario 2020 – World War 3 ended. Malaysia suffers heavy losses and damages in terms of buildings and houses. Thousands of people are left homeless. The Government is in critical need of houses and buildings. At the same time, an invention called 'Capsule House' has been invented. The capsule houses invention is very cheap and it is portable. The Government decides to give each Malaysian, one person one capsule and free of charge.	<p>The company's increase capacity in manufacturing houses has tremendously help the government in providing houses to the homeless people after the war. The research that have been done earlier also have produces technology that is even better than the 'Capsule House'.</p>
Revolution Scenario 2020 – Indonesia becomes an economic power house. Indonesia's population increases drastically. Malaysia's economy started to collapse due to the shortage of skilled workers. The diseases are spreading rapidly throughout Malaysia.	<p>The company has successfully captured the Indonesia's market for housing. The company's operation also has moved from Malaysia to Indonesia.</p>
Retribution Scenario 2025 – Companies that promote technology such as Industrialised Building System is no longer relevant as Capsules Houses are made in bulk volumes and subsidized by the Government.	<p>Due to the extensive research done earlier by the company, it has produced an even better version of the capsule house.</p>
Revolution Scenario 2025 - The collapse of Malaysian economy and added by the chaos caused by the disease has made the government very unstable. This chaos is followed by a military coup. The Government is overthrown. Housing projects are totally controlled by the government with only appointed agencies can build building and houses.	<p>The company has now move forward from the Indonesia's market to other global market as Malaysia's market is no longer suitable.</p>

viewpoints

From the scenario planning exercise also, a major future strategic activity has been identified that was not on the previous plan of the company. As can be seen in the 'Revolution' scenario, the company decided to move its operation into other countries and therefore started to penetrate the global market.

REVIEW AND CONCLUSION

The scenario planning exercise shows that initial guesses on the outcome of an event can be very different if the event went through scenario planning. Assuming that radical and catastrophic events will usually bring negative impact to businesses can sometimes be misleading. The skill sets that scenario planning provides are the ability to manage the future. By predicting the unpredictable, the outcome of the future will not be as shocking since the anticipation of the event have been made. By strategising the company based on the worst case scenarios will make the company more flexible in management and also its approach. Strategic decision can then be made based on several indicators of future development.

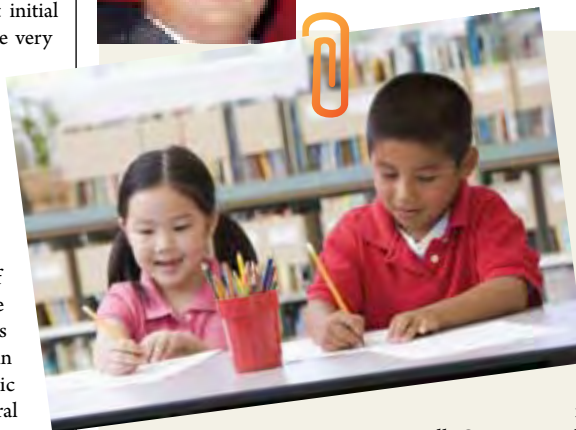
The end result of the tool can also be varied according to the person or the group who is drafting the story line. Multiple scenarios that have been created are usually based on that people or group's personal experience and knowledge. This will limit the result to a demographic, culture, value and religious background of the group or person. For example, a person or a group consisting people from Asia that was given the same list of ideas will generate different story line compared to a person or group consisting people from Europe. The result of the scenario planning can be improved by forming a group that consists of people from different background, skills and society. This will enhance the story line even further and create multiple scenarios that can be shocking and worthwhile.

Einstein once quoted 'A problem cannot be solved in the same framework where the problem was created'. Therefore one suggestion that can improve the result of the scenario planning is by separating the group of people who created the storyline with the group who will create the strategies to counter and prepared the company's decision based on the storyline. By doing this, the group who will derive the strategies will have different and fresher view of the multiple scenarios storyline. Effective strategies can then be created and be used by the company with even better planning.

A Letter From The Future



BY
PATRICK ETHE RAJ
Executive Director,
Nasmech Technology Sdn. Bhd.



Dear Friend,

It has been 10 years since you migrated and I have stayed back due to environment of safety, political balance and security, social integrity and lastly our medical health benefits.

Our country is actually credible and has good governance. However, as you see and know, we are still in our traditional economy base and have not changed very much. I wonder if we

ever will. Our income has grown but net disposable income ...

Well, I still ride the old iron horse and live in same old house because my disposable income, should I say, is insufficient for me to afford new ride and home.

Some people – politician of course – claim our education system is at par, if not better, than some developed countries, but they send their children overseas for further education. Of course I would do the same if I can afford them. The state of human capital development and knowledge base is in great need of improvement. Do not forget our language barrier if we want to go global. Innovation is at almost 0% and the country and we are not bothered.

Globalization has played no role in our development. The information knowledge management and communication has evolved. But we are going nowhere and happy with our traditional economy. (Agriculture, Commodity, etc).

As you know, we are still 'going by the book' in many ways and you can know our commitment in Copenhagen for 40% reduction. All are still wondering on why we committed to this as our education, innovation and S&T requires more attention.

However my friend, as you know I, as a typical Malaysian enjoy my own comfort zone and safety. I have watched the world move on and yet I'm not bothered. I am happy as usual as I have come to conclude my way of life in 'Don't worry, be happy'.

Hope you enjoy your life in your new home. As for me, as my nasi lemak and laksa in my back stall brings me huge relief and happiness.

Regards,

Patrick Etthe Raj

Bina Puri Holdings Bhd is a public listed construction company on the Main Board of Kuala Lumpur Stock Exchange, with 35 years work experience in civil and building construction both locally and internationally. The Group's diverse business activities include investment holdings, civil and building engineering management, property development, highway concessions, quarry operations, manufacturing of construction materials and polyurethane system houses.

The Group is certified with MS ISO 9001:2008, OHSAS 18001, MS 17922 Certifications and has won many accolades worthy of mention including the Prominent Player Award 2006: Malaysian Construction Industry Excellence Awards 2006 (MCEA 2006), the Contractor Award 2007: Grade G7 (MCEA 2007) and the International Achievement Award (MCEA 2008) awarded by the Construction Industry Development Board of Malaysia.

Bina Puri had successfully completed projects like roads and highways, bridge works, airport works, waterworks, residential and commercial buildings, hotels, hospitals, Government complexes, embassy complex and has Operations Offices in Thailand, United Arab Emirates, Pakistan and Brunei Darussalam.



Jettison Villa, Kota Kinabalu



Kiam 50 @ Mount Kias North



Proposed Condominium Development in Puchong, Selangor



Overseas Project, Residential Apartments, Al Raha Island, Abu Dhabi



QUARRY OPERATION



BUILDING CONSTRUCTION



CIVIL & INFRASTRUCTURE CONSTRUCTION



PROPERTY DEVELOPMENT



POLYURETHANE SYSTEM HOUSE



MANUFACTURING OF CONSTRUCTION MATERIALS



HIGHWAY CONCESSION



Prominent Player Award to the Group Managing Director, Yeng Eshammet Saadur bin Ali Dabit for Best Group AP by CIDB for Malaysian Construction Industry Excellence Awards (MCEA) 2006



Contractor Award G7 awarded by CIDB for Malaysian Construction Industry Excellence Awards (MCEA) 2007



International Achievement Award by CIDB for Malaysian Construction Industry Excellence Awards (MCEA) 2008

A young green plant with several leaves is growing from a forest floor. The ground is covered with dry, brown leaves and twigs. The background is a soft-focus forest scene with more trees and foliage.

MAP THE FUTURE

As a strategic policymaker or stakeholder, you can help map out a desired future for Malaysia.

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We look forward to hearing from you.

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